The Journal of The Madras Geographical Association

Vol. 9 January 1935 No. 4

Fifth Geographical Conference at Anantapur

(24th December, 1934)

PRESIDENTIAL ADDRESS

By

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Ladies and Gentlemen,

It gives me very special pleasure to be here to-day, presiding over the Fifth Conference of the Madras Geographical Association, with the inception of which, nine years ago, I was identified, not only as a foundation member, but also in having the privilege and responsibility of delivering the inaugural address on the historic occasion of its first public meeting. My interest in the Association is therefore of a somewhat paternal kind, and includes excusable pride in its achievement and solicitude for its future development and progress.

Such being the case, I am naturally tempted to indulge in parental reminiscence and to touch on the varied activities of the Association, though the nomadic nature of my life during the past few years has prevented my taking more than a spectatorial interest in its work, and though you will more appropriately take stock of your achievements *in extenso* at your first decennial celebration next year.

You have, by means of lectures, papers and addresses, made studies of South India from various geographical points of view, and have recorded the results in your Journal, which is a clearing-house of geographical thought and research.

By means of summer schools and refresher courses you have sought to fulfil another of your chosen objects, and have helped to improve the methods of teaching geography in many schools in southern India.

Through the excursions which you have organised, sometimes as part of summer school work, you have demonstrated that the right place for the study of real Geography is in the field; that geographical books are to be found in running brooks, and geological sermons in stones; that facts and inferences of Geography are more intelligently studied in their natural setting than by any description or imitation of them within class-room walls, useful though these descriptions and imitations are as accessories.

In your annual Conferences you have attempted to make detailed studies of particular districts as a team-work from different points of view, thereby not only adding to the sum total of geographical knowledge, but interesting the people of the chosen district in their own particular environment, and incidentally disclosing to them the potentialities of their own region.

To these particular activities you have added that of dissipating the poor opinion of the subject of Geography that was generally held in India before you began your work, and of securing for it in India the same position in educational respect as it has long had abroad. By undertaking all this much needed work your association has won for itself a high place among the active educational institutions of the country.

So much for your effort and achievement; and when we remember that it is the record of a body not yet numbering five hundred members, we can assuredly anticipate much longer steps towards the goal of making Geography an integral part of education in India, if the Association can only win the co-operation of the thousands of teachers, and not only of those who teach Geography, to whom the subject should appeal as one of the most stimulating, idealistic and at the same time realistic, means to a complete education, a real educing of human capacity. In such work as that of the Madras Geographical Association, numbers give the strength and confidence by which things can get done. They also bring greater additions to knowledge, wisdom and experience, and lead to a wider broadcast of what is worth broadcasting. I suggest that, as a special decennial effort, each member should not only see that he himself is in good standing on the register of the Association, but should induce another friend to join it during its tenth year, and thus change the denomination of membership from the monotony of *hundreds* which it has so long maintained, to the refreshing denomination of *thousands.*

The Association needs all the strength and prestige it can derive from members and consequent extension of work in order to bring about the much needed improvement in the position of

Geography in the educational systems of India, and in order that geographical research may be carried out in a more extensive, intensive and fruitful manner.

Let me recall to your minds, in this connection, the present unsatisfactory state of affairs concerning the position of Geography in schools and colleges in India. In all the important universities abroad, Geography is not only an ordinary graduation subject, but qualifies also for Honours, Master's and Doctor's degrees in both the Arts and Science courses. It is a tripos subject at Cambridge, and is one of the main subjects in the competitive examinations for the Civil Service.

And how does Geography stand in the South Indian universities ? In none of them has it been accorded its proper place. In the University of Madras it has a nominal position in being accepted in theory as a degree subject ; but Branch VII has no existence outside the University Calendar. The position of Geography in the Intermediate stage is not very much better than it is in the degree stage. It is true that the University of Madras and the Andhra University have Regulations concerning it. But in the University of Madras it has a slender and precarious existence in one college only, and that a women's college, which provides for the teaching of Geography at the Intermediate stage, but finds itself in a blind alley since the students cannot continue the subject in the degree course.

In the early enthusiasm for Geography, when, as a result of the Slater-Grieve Committee's recommendations, it was included for the first time in the remodelled Intermediate course of the University of Madras, as one of the optional subjects in the Science group (Part III, Group I), five affiliated colleges immediately started teaching it, and attracted a number of students. But the exacting demands of the University in regard to equipment and formal teaching qualifications quenched the enthusiasm, and the colleges were forced to close the new branch.

Had the University been seriously disposed towards the subject it could have given a reasonable time for such improvement in equipment as is now being effected in other cases. The teaching staffs, who though they had not the required formal qualification in the shape of foreign degrees, were found to be competent on account of their knowledge of and enthusiasm for the subject, might have been temporarily accepted until teachers with the requisite paper qualifications were available. But unsympathetic red-tape and unresponsive Regulations finished the matter. Ten other colleges that had given notice of their intention to start Geography in the Intermediate course took the warning, and confined

their endeavours to the more academically profitable if less educationally valuable subjects, and another instance of pedagogical opacity was added to the history of education in India. And now, when the awakened conscience of the University of Madras has induced it to try to make amends by providing the requisite qualification in a Diploma Course in Geography, the colleges are in no mood for reopening or starting the teaching of the subject, though convinced of its high educational value. This is partly due to the general financial depression ; but it is also partly due, I gather to the memory of the past action of the University and fear of its repetition. I sincerely trust that steps will be taken on both sides to dissipate this inhibition.

This regrettable state of affairs has not only kept Geography out of the colleges, but has had a detrimental effect on the subject in the schools. The graduate teacher of other subjects enters the Training College with a guaranteed previous knowledge of his subject. But in Geography alone there is, in the Training College, the paradoxical spectacle of prospective teachers being taught the pedagogy of a subject without a previous knowledge of the actual subject—a striking but lamentable example of putting the cart before the horse, and also of giving official patronage to the mere bookishness of much of Indian education that good educators deplore. Such a practice, which would not be tolerated in any other subject of a scientific kind, puts a premium on shallowness, and explains, though it does not justify, the widespread but false notion that anyone is fit to teach Geography. I know from my own experience as the head once of the Geography department of an Irish High School how utterly wrong such an idea is, and what educational riches are being allowed to lie unused, under surface ignorance as to what Geography really stands for in applied knowledge, informed intelligence, and faculty development.

Obviously the Training Colleges should take advantage of the Diploma course in the University as an essential preliminary qualification of a teacher undergoing training in Geography, and should take in such diploma holders irrespective of previous service, guaranteed appointment, or other restrictions, which may or may not be necessary in normal circumstances, but should be temporarily waived in the case of a new subject. If sufficient diploma holders are not available for training in the subject, then others might be chosen under the conditions that they should have handled the subject for a certain minimum time. If the heads of Training Colleges acted thus, they would induce a beneficial steadying of the Diploma course, since more graduates in allied subjects would find it worth their while to undergo the course, which would thereby

become more popular and remain so until effective provision was made for the teaching of Geography in the degree course.

I hold, along with you, that Geography should be one of the "constants" of school education. Indeed, I go personally further and hold—that I am not here as a propagandist of the idea—that if primary and secondary education were Geographised (if I may coin a word), that is, if knowledge were based on the environing life of the student, it would become much more evocative of human capacity than it is. It would also demand extensions of special aspects at college level, and thus influence so-called higher education, instead of being, as it is now, to its detriment, largely dependent on university initiative. The result of this dependence of school Geography on the influence of non-existent college Geography is that, of 20,000 candidates in the S. S. L. C. examination, only about 200, or one per cent, take Geography in the C-group, since, as we have already mentioned, there is no provision for its continuance in any of the men's colleges and in only one women's college affiliated to the University of Madras.

Observe the vicious circle in which the matter is imprisoned. Colleges, like my own, that earnestly desire to affiliate in Geography in the Intermediate course, hesitate to do so lest no students coming up from the High Schools should apply for it. That is one side of the circle. I know the other side also, because, in addition to being the Principal of a first grade College, I am Correspondent of a High School, and am aware of the impossibility of getting students to take up C-group optional Geography for the S. S. L. C. examination, for the plain and understandable reason that there is no available provision for carrying on the study in a college. Such a state of affairs in regard to one of the most valuable phases of education obviously calls for drastic and prompt attention by the educational authorities.

The situation of Geography in the schools is even worse than I have indicated above. In the 1930 scheme it was a subject in Group A, and given in all the high school forms. Under the scheme of 1934, with Geography as a discouraged optional with no future, the last geographical knowledge that the pupil will receive will be in the fourth form. What little has been learned up to that stage becomes useless, and two valuable educational years are geographically lost—and this at an epoch in human history when the life of the humblest inhabitant of the remotest village in India is in some degree affected not only by happenings but by the influence of anticipated happenings on the other side of the world, happenings whose interpretation rests largely upon geographical facts.

Something could, of course, be done to ease this impossible situation if Headmasters would only encourage students to take Geography in a group, say with Physics. Such a group would be mutually helpful through the affinities of the subjects, and could become both popular and educationally most useful. The Science subject could be carried over into the Intermediate college course until some wise action by the University gives geographically minded Principals, like myself, the push and excuse to intimidate their managements into making the necessary provision for teaching Geography.

The syllabuses and teaching of Geography in the middle and lower schools are decades behind the times both in presentation and practice. The text-books make a sorry contrast in their substance and get-up with text-books in other countries, and this does not arise from lower finance but from lower taste. The teaching still treats the minds of the children as godowns for the storage of facts instead of cultural thoroughfares, and has very little practical application or actual contact with the wonder and magic and joy of Nature. Reform is here needed perhaps more urgently than anywhere else, for here the foundations of the geographical edifice in the mind are laid. And one essential element in such reform is the provision of text-books, compiled in attractive form, in the modern spirit, oriented to the Indian scene—even to northern and southern divisions of it because of characteristic and highly informing geographical variations—and written in the mother-tongue of the student.

With the teaching of Geography treated as it is in the schools and colleges of South India, it would be more than optimistic to expect the higher aspects of geographical science to fare better. Geographical research, as it is practised in other countries, is unknown here; not simply a more or less freakish working up of peculiarities for the sake of personal distinctiveness, but the true co-operative investigation into apparently important but imperfectly known matters such as geographical science stimulates and always rewards.

It is true that research in any subject is technically a "higher study", sometimes glimmering on the hither side, but mostly on the thither side, of the horizon-line that is marked "B.A." or "B.Sc." on the diagram of academical achievement. But real research completes the educational circle by presenting fuller knowledge and rectified methods by means of which the elementary teaching of the subject may be brought nearer reality. In Geography, I will venture to claim, research is not merely a higher

study, but should be its essential and continuous technique from the lowest standard onward. The data of geographical study are always at hand, always varying, always capable of some degree of mental and emotional appreciation by the youngest student, always vibrating with significance to the geographically minded.

I can recall vividly the look of illumination on the face of a Tamil boy of the farming community when, in an unofficial Geography class, which I instituted and taught in the Theosophical High School at Madanapalle seventeen years ago, he discovered the rhythm of wet and dry years in a graph that he had made, and called my attention to the possibility of adjusting agriculture to recurring climatic changes if such records were maintained for a long time. That subject and many others are asking for study. There is not a phase of human life that would not be the better of geographical illumination. The bearing of Geography on History has been given academical recognition for some time; so also has its bearings on Economics. But little or nothing in the way of actual work along such lines has been done in India in comparison with what has been done and is being done elsewhere, notwithstanding the challenge and invitation of the vastness and variety of the Indian field.

I know, from personal participation, the infective enthusiasm, the intellectual delight, and the sense of being in touch with realities that is inherent in such research; and I envy the teachers and students of other lands who have the opportunity and encouragement to attain such experience. I shall relate an example of how educational authorities elsewhere deal with geographical research.

When Geography, in the modern sense, became a grant-earning subject in secondary education in Ireland in 1909, summer courses for prospective teachers of Geography were instituted by the educational authority. Great geographers were brought to Dublin to lead the courses. I was then the head of the Geography department of The High School, Dublin, which was the principal feeder school of Trinity College, but I was not eligible for the first summer course because I had not taken a two-years course in preliminary science which was required of candidates, my interests as a young teacher having been mainly literary and pedagogical. I happened, however, to have published the first "Text-book of Modern Geography for Irish Intermediate Schools", and this book had found its way into the summer course from which I, its author, was closed out. It had also happened that my department of the school, which had been opened by a wise Headmaster some years before the official recognition of Geography purely as an educational subject and would be continued even if never a shilling

of grant was earned, had become recognised as a model, and had been occasionally visited by school inspectors with an hour to spare who wanted hints on geographical teaching. The authorities, being either Irish or long enough resident in Ireland to be able to see a joke, appreciated the humour of my situation, and invited me to the second summer course—not as a student-teacher, but as a demonstrator to Professor Herbertson of Oxford and to Professor Grenville Cole, the famous geologist, who was then Dean of the Royal College of Science in Ireland in which the course was held.

But the point concerning the bearing of Geography on History and Economics is this. I happened to refer to the peculiar fact that my native city of Belfast, to whose first *Lord* Mayor I had been private secretary, had won world-renown for certain industries—such as linen-weaving, rope-spinning, ship-building—yet had to procure the raw materials for these from other countries. This brought up the question of the beginnings of these industries, and led to French history and the migration of Huguenots to Ireland, and to psychological considerations arising out of human character, also topographical, geological and agricultural features around the city. Educational intiative had provided a sum of money for any spontaneous geographical adventures that those at the head of the course might consider worth while. Result: forty teachers, men and women, Protestants and Catholics, were sent under specialists a hundred miles in a saloon carriage by rail, three miles by electric tram-car, and three or more miles on foot, from Dublin to the summit of the Cave Hill overlooking Belfast, where I had to give a talk on the economic progress of the city which lay as a model below us, with vast shipyards and forests of tall chimneys, telling of human industry, spread over areas where as a schoolboy I had wandered through grass and waded swamps and jumped ditches. Next week the student-teachers presented illustrated essays based on what they had seen, what I had told them, and what they had read in the library of the college.

Such adventuring in knowledge is but a tiny fraction of what any province of India offers to education, and not only on the historical and economic aspects of human life, but on the deeper influences of environment on religion, philosophy and art. Geography, in one of its departments, can explain why the figure of Ganesh in South India is depicted usually sitting, while a Ganesh on a lamp that came to me from Nepal is in an energetic standing position. Another department has something to say on the difference between the stone structure of the Dravidian style in Madras

Presidency and the brick structures of Paharpur in Bengal. The tip-tilted roofs of the west coast; and the similarity between the entrances to temples on the road between Alleppy and Quilon in Travancore and those to temples in China and Japan; the affinity between certain temple roof-shapes in Cochin and the Temple of Heaven at Peiping; these and other related matters do not concern only the student of archaeology, art or ethnology: their interpretation will remain incomplete until the geographer says his say regarding them.

I need not labour this point further. The question is, cannot the new Geography Department controlled by the University of Madras be utilised for the undertaking and the patronising of such good work, and for the encouraging of general geographical education, both indirectly by dignifying the subject in the estimation of all concerned and directly by expanding knowledge and improving method. In any event, here is an urgently needed work for the Madras Geographical Association itself to undertake, and a patent reason why all interested in the subject should join and support the Association.

I have referred to the excursions which you have popularised. The opportunities for these have much increased in recent years through the development of travel facilities. Long distance excursions by rail are easy and cheap. The development of traffic between points away from the railways has opened up incalculable possibilities of geographical field-research in areas where History and Art and the movements of human groups await recovery and interpretation.

Here we come upon a consideration to which I attach very great importance from the educational point of view, that is, the point of view of drawing out all the powers of the individual, the emotional no less than the mental and bodily powers. The relationship between Geography and aesthetical sensibility—a crying need the world over and specially in India—may at first mention appear very remote; but I am convinced that the full geographical experience cannot be attained without the thrill of wonder and joy that is the sign of man's kinship with the mystery and beauty of nature.

Textual work and laboratory demonstration can, of course, give that thrill. I shall never lose the memory of my emotional response to my first sight of the Atlantic foramenifera under a microscope. The scientific fact of myriads of microscopic entities coming into and going out of existence in a day, yet laying with

their almost invisible shells the foundations of aeonian geological history, was itself immensely impressive, but somewhat stultifying to a conscious human being placed midway between minuteness and vastness that seemed to take no count of him and his problems educational or other. But the intimate sight, through the lens, of the almost invisible spot of white that I had picked with tweezers out of a handful of Atlantic ooze, put me in emotional rapport with both the infinitely little and the infinitely great, for it touched the creative artist that is in me, (and in every normal human being though frustrated and starved by incomplete education), by its exquisite form, its incomparably beautiful sculpture, its pure colour, its infinitely delicate texture. Recognising these qualities, I realised that I myself shared them, otherwise I could not have recognised them. I was not merely a spectator of unresponsive cosmic processes but a participant in cosmic creative joy, the *ananda* of the universe.

But laboratory demonstration is restricted by room-space and by paraphernalia which can only be used by a few ; while nature, in her ever busy laboratory, workshop and studio and on her perpetually moving stage, is waiting to open out her secrets and share her life with those who will open themselves out to her revelation and influence. Geographical excursions, therefore, should be neither irresponsible *tamashas* nor occasions of mere peeping and botanising such as Wordsworth very rightly reprobated. It is true that you can get special clarity, accuracy and assurance from research along a short base-line. But in a true geographical survey, as sometimes happens in a chain survey, the offsets may lead us to much more interesting and valuable points than the A to B of the scientific base-line. In saying this, I am not saying that the base-line can be ignored, for without it, mental data would be unintelligible because unrelated, and emotional reactions would be chaotic because undirected. What I desire is balanced completeness.

It comes, then, to this ; that geographical teaching, study, research, or field adventure, while seeking, recording, tabulating, graphing, and interpreting meteorological, geological, and biological facts as to the substance, organisation, and functional activities of the various constituents of human environment, should be conscientiously accompanied by aesthetical pleasure in design, colour, texture and perfume. A countryside paced out for a plan or rummaged for specimens should also be enjoyed as a landscape. A barometrical or thermometrical reading should lead us out from an instrument to enjoyment of the sapphire of noon or the gold of sunset. In this way, Nature will find opportunity to speak to man

with greater truth because with greater beauty, and the commonplace will become invested with grace and significance. Moreover, other human faculties than those used in purely scientific investigation will be called into activity. Contemplation, as distinct from observation, will be aroused; aethetical enthusiasm will pass over into the creative impulse that moves through all beings, and individual and group life will inevitably and peacefully be moulded "nearer to the heart's desire".

This I take to be the ultimate Geography towards which the science is evolving, Creative Geography that, when practised in the education of the young and maintained in the interest of life through the future universal adult education, will bring into being "the great race" to which the poet Yeats looked forward. It will also, I believe, ultimately affect for good the aspirational aspect of human nature, and bring the religions nearer to the truth of life and nearer to a truer worship of the One Power and the many Powers that are shaping and energising the universe. Powers that Science calls by various impersonal names and religions personalise as God and the Gods.

Permit me to add, as a Gothic finial to the foregoing edifice of geographical belief, an example of the creative influence of Nature as expressed in verse. The following lines, entitled "Invitation at Sunset", were my own reaction to certain sights and sounds noticed on a walk in the fields around Madanapalle College. Looking at them now, with critical objectiveness, nine months after their composition, I see that they move from observation of the panorama of life on the earth to the impressive pageantry of sunset, and pass into contemplation and reverence. Of the complete artistic effect and quality of the poem it is not my office to speak.

Come where the coriander its aromatic breath
Exhales as a loosened spirit that seeks not the
    boon of rest;
Where, high in the tamarind, mews like a kitten
    the bird of death,
Its eye on the chittering weaver-bird that shrinks
    to its nest.

Holy the daylight was; as holy shall be the dark:
Holy the place and the moment where life to life now calls:
Holy the shrine-topped *kondas* that eastward and
    westward mark
The Day-God's myriad births and myriad burials.

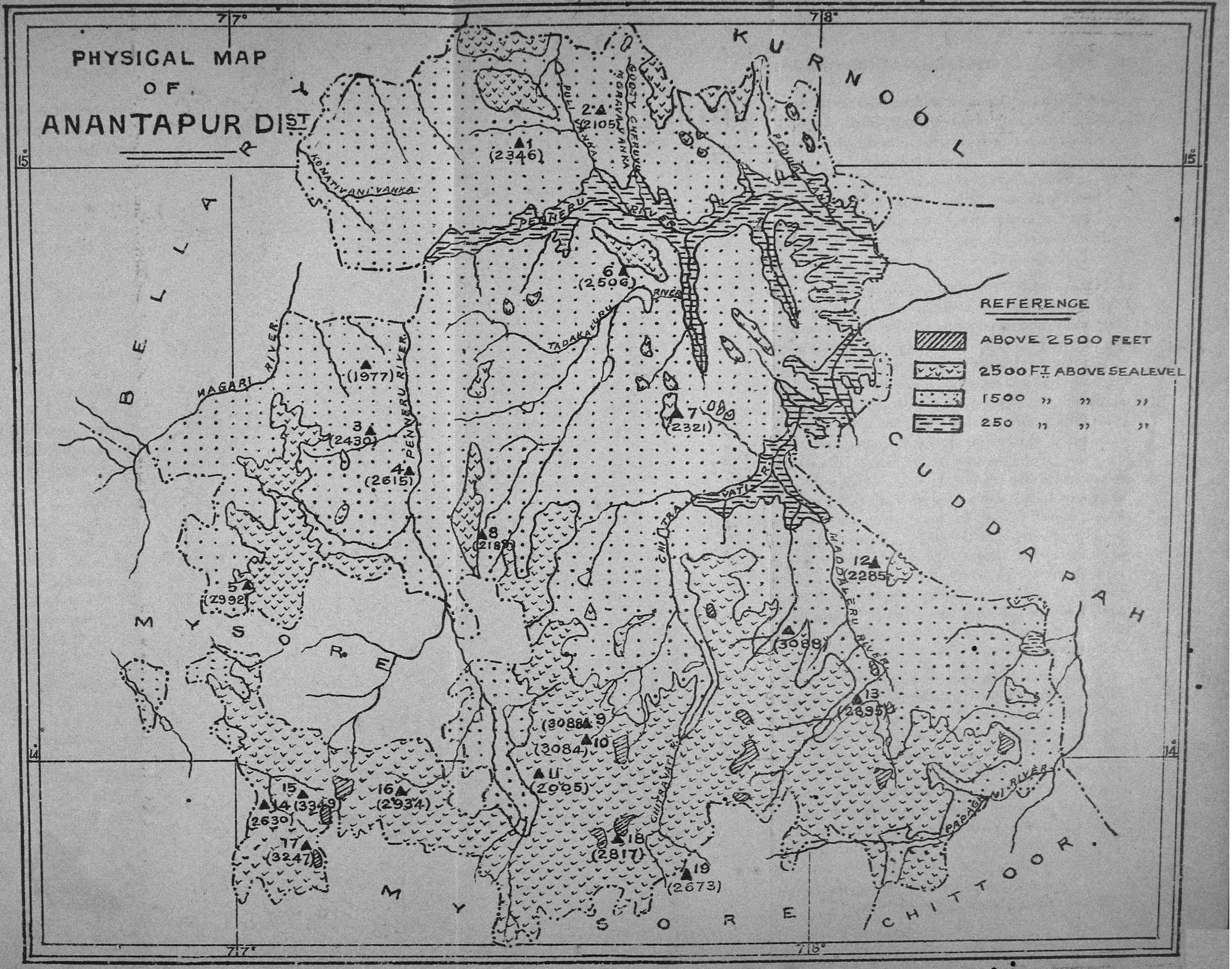
Shall we hold that the Day's fulfilment is all on the
    forehead bowed

Of Light by Darkness dethroned and humbled in red retreat?
Nay, look you! above the standards of Night a crimson cloud
Floats as a flag from a bastion denying the Day's defeat!
A million days . . . and a million . . . and the end thereof
who knows?
What will be, will be. What is, our lifted hands acclaim.
Lost not in the sweet and splendid sadness of how Day goes,
We lose not the joy of the triumph and wonder of how
it came.

Ladies and Gentlemen: I may seem to have wandered far from the immediate concerns of a Conference of Teachers of Geography and sympathisers with the subject; but I have long felt that the ultimate best service to anything is rendered when, in addition to dealing with particulars and departments, we seek for inclusive generalisations in which details are implied and co-ordinated. In doing so, we are simply anticipating the trend of geographical development from its early plain record of observed facts to its enrolment among the biological sciences as œcology, the study of the constituents of human environment and of man's responses to them. We are now entering the psychological phase of geographical history. Aesthetical Geography has been suggested. I myself suggested some years ago that Geography would not always remain at the stage of answering questions as to *How?* of things, which is the function of science, but would some time be interrogated as to the *Why?* of things. Then it will take on the role of philosophy, and its true name will not be "Geography", the describer of the earth, but "Geosophy," its interpreter. After that it will reach the creative phase, and its still truer name will be found.

Meanwhile, we address ourselves to the work of the Conference. You will, as at former Conferences, listen to papers on various aspects of the Geography of the District of Anantapur, an area presenting much geographical interest, climatic, geological, historical, economic, and cultural. I shall not steal any of the geographical thunder of the essayists by anticipating their contributions. But I cannot resist the temptation to hope that the cultural aspect of the study—that is, the influence of environment on the higher phases of human life and expression, manners and customs, folk-lore, arts and crafts and literature—will receive as much attention as the physical and utilitarian aspects.

I have much pleasure in declaring the Fifth Conference of the Madras Geographical Association open.


PHYSICAL MAP
OF
ANANTAPUR DIST
REFERENCE
ABOVE 2500 FEET
2500 FT ABOVE SEALEVEL
1500 " " "
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KURNOOL
BELLARY
MYSORE
CUDDAPAH
CHITTOOR
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77°
78°
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PENNERU RIVER
HAGARI RIVER
PENNERU RIVER
KONATIVANI VANKA
PULI VANKA
GOOTY CHERUVU
MORAVA VANKA
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TADAKALERU RIVER
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1 (2346)
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The Physiography of the Anantapur District

By

Mr. P. Sridhara Rao, M.A.,

Anantapur, Bellary, Kurnool (except four taluks) and Cuddapah were ceded to the East India Company by the Nizam in 1800 and are known as the Ceded Districts. In shape the district of Anantapur is roughly a rectangle except the south-eastern taluk. Madakasira is separated from Kalyandrug Taluk by a part of the Tumkur District of Mysore State. On the west Anantapur is limited by longitude 76° 50′ and on the east by 78° 30′; north to south the district is longer lying between latitudes 13°.40′ to 15°.15′. The district is bounded on the east by Cuddapah, on the north by Kurnool and Bellary, on the north-west by Bellary and on the west and south by the Mysore State. To the south-east of Anantapur lies the Chittoor District.

This district is the southern and south-eastern termination of the Deccan Plateau. The general slope of the country is towards the north. But in the northern portion the slope is towards the east. The larger rivers of the district therefore flow due north, east or north-east. The main rivers which drain the country are the North Penner or the Uttara Pinakini and its tributary Chitravati. The general slope towards the north is up to the bend of the Penner after which there is a gentle rise in the Gooty Taluk and the northern part of the Tadpatri Taluk. The western parts of Gooty, Kalyandrug and Madakasira slope to the west towards the river Hagari.

Penner or Penneru takes its rise in the Nandidrug Hill on Mysore Plateau. From its very source it has a northerly trend. It enters the Anantapur District in the extreme south of the Hindupur Taluk. It is the most important river in the district flowing through seven taluks and receives in its course the waters of the eastern taluks by its tributary the Chitravati. Its course of about 130 miles can be sharply divided into two parts. First it flows directly north passing through Hindupur, and the western margin of Penukonda and Dharmavaram, and then through Kalyandrug and Anantapur. It forms a natural boundary between Gooty and Anantapur Taluks for a part of its course.

Lastly it flows across Tadpatri Taluk into the Kurnool district. Pamidi and Tadpatri are the only two towns that lie on the banks of this river. The river bed is wide and sandy and the banks are usually low. Among the hills, especially near Penna Ahobilam, we find the river channel narrow and the bed rocky. The river bed is dry for a major part of the year. The freshets that come down during the monsoon flow for a few days after which a small narrow channel of water persists for a short time before the bed dries up again. Irrigation under the river is done by diverting a part of the water from the bed into the channel by means of sand dams. These sand dams are of a temporary character and are washed away by the next flood.

The Chitravati rises in the north of Nandidrug in Mysore east of the head-stream of the Penner. It enters the Anantapur district near Kudikonda hill in the south of Hindupur taluk, and travels north across the taluk and then enters Penukonda. In the latter taluk it has made for itself a narrow gorge through the hills. After several miles of swift flow it enters the plain of Bukkapatnam. Here the water enters a large tank where it is stored for irrigational purposes in the neighbourhood. After filling this tank the river, now a very narrow small stream, resumes its course. It flows due north into the Dharmavaram Taluk. Near Dharmavaram town the river again forms a tank. To the north-east of the tank the Chitravati starts again. It is now more lucky, for it soon receives a number of other streams and attains a considerable size. It leaves the district after a sinuous course and joins or rather flows into the Penner near the Gandikota gorge in the Cuddapah district. This river is dry throughout the year except during the freshets.

Maddaleru River. There are a number of hills separating the Penukonda and Kadiri taluks. Small streams from these hills join together and form the Maddaleru. This stream attains a considerable size in the northern portion before it empties itself into the Chitravati at the village of Chinnachigullarevu.

Hagari River, an important tributary of the Tungabadra forms the natural boundary between Mysore state and Kalyandrug on its north-western side.

Jayamangali takes its rise in the Mysore Plateau and after flowing in Hindupur taluk for about 15 miles it joins the Penner at Utakuru village. It is a river worth mentioning because of its considerable size.

The Tadakaleru is a river of local importance. Rising in the southern portions of the Nagasamudram line of hills it flows north-eastward into the Singanamala tank.

The Pandameru is another small river which feeds the Anantapur tank. The waste water of this tank continues this stream, which joins the Tadakaleru before it feeds the Singanamala tank.

In addition to the above, there is a number of small streams which feeds the Penneru from both sides. Also there are nearly 800 tanks in the district which depend for their supply on temporary streams called *vankas*. It must be clearly understood that all the rivers abovementioned are almost free from water for a large part of the year. The *vankas* are even more so. They just serve to collect the waters from local showers and feed the small tanks. Of course this source being precarious and the tank bed being gradually silted up, the tanks and the *vankas* that fill them play a little part in the economic condition of the people.

Orography. There is a large number of hills in the district. The general level of the country is high, especially in the southern and central portions; and the land ranges in elevation from 1,500 to 2,000 feet above sea level. It is this elevation that makes Anantapur enjoy a fairly cool climate for about 8 months in the year and prevent it from being as hot as the other districts of Rayalseema. The hills above this elevation are not of any great size, and they are not given any definite generally accepted names, except that local names like Yerrakonda, Nallakonda, etc,. are given for certain peaks. There are five regions where the hills are grouped together to form low ranges.

1. *Muchukota Range.*—This range of hills, called after the Muchukota or Mutsukota reserve forest runs between Tadpatri taluk on the one side and Gooty and Anantapur on the other. Starting from the north of Gooty they run south for a distance of about 35 miles. At about their southern end the river Chitravati crosses the hills at right angles by a deep and narrow gorge. The river at this point is of considerable dimensions having received a few tributaries after leaving the Dharmavaram tank. This range is so high and rocky that there are only two roads crossing it, *viz.*, those that connect Tadpatri with Anantapur and Gooty. Many hills on this range are made up of rocks which

geologically belong to the Cuddapah system. There are found among the sedimentary rocks contemporaneous traps which can be traced into the Kurnool district in the north-east.

2. *Nagasamudram Hills.*—This range is not well-marked as the previous one. The hills start from the middle of Gooty taluk and run due south through the western portions of Anantapur and Dharmavaram taluks. There are numerous gaps in the range. The hills decrease in height as we pass south; but in the extreme south the Kondapalli hill, which is 2,255 feet forms an exception. The total length of the range is slightly more than fifty miles, while it is never broader than five miles.

3. *Mallappakonda Range.*—In the eastern half of the Penukonda taluk is a confused range of hills. They have no fixed direction. These hills may be considered to form a natural boundary dividing the Penukonda and Kadiri taluks. A north-eastern wing runs to the town of Dharmavaram. A number of small streams have their source among these hills; and these streams join the Chitravati directly or fall into the Maddaleru river. This range is named after its highest point Mallappakonda 3,088 feet above sea level, (lat. 14°-15' long. 77°-50'). The range runs further south into the Mysore State.

4. *Penukonda Range.*—This range starts from the south of Dharmavaram taluk and runs almost due south. It passes Penukonda and Hindupur taluks and enters the Mysore State. The hills form a very confused range with a number of breaks, the most important being just north of Penukonda town.

5. *Madakasira Hills.*—The Madakasira taluk is roughly divided into a northern and a southern portion by a group of hills. These hills of this taluk differ from those in the other taluks that they support good vegetation and they are more a series of high peaks than a range of hills.

While these five ranges of hills mentioned above can be made out, the district has also a large number of detached hills and solitary peaks rising up from the high plains. These hills are, on the whole, more or less level-topped rather than rising into peaks.

In the north-western corner of the district rocks of the Dharwar system of Indian geology have been observed. The rocks of all other places (excepting those belonging to the

Cuddappah system already mentioned) belong to the Archaean system. The rocks are all gneisses of different kinds with intrusions amidst them of dykes and traps. Remarkably long dykes running for 40 and 50 miles have also been observed in the central position of the district. But as all this is worked out in full in the Paper on the Geology of the district, no account of it is attempted to be given here.

PEAKS OF OVER 2000 FEET ARE NOTED BELOW.

		Name of Peak.	Ht. in feet.	Approximate lat. and long.	
Gooty	1.	Boglemarkonda	2346	15° 5′	77° 30′
	2.	Gooty	2105	15° 8′	77° 38′
Kalyandrug	3.	Devadelabetta (within a mile of Kalyandrug)	2430	14° 34′	77° 5′
	4.	Palvoi hill	2615	14° 29′	77° 10′
	5.	Kondarpidurga	2992	14° 18′	77° 2′
Anantapur	6.	Gumpmal	2506	14° 50′	77° 40′
Dharmavaram	7.	Avuladevarakonda	2321	14° 35′	77° 42′
	8.	Uravakonda	2189	14° 15′	77° 35′
Penukonda	9.	Mallappakonda	3088	14° 15′	77° 47′
	10.	Penukonda	3088	14° 5′	77° 35′
	11.	Bommasandra	2005	13° 58′	77° 29′
Kadiri	12.	Pipad	2285	14° 20′	78° 8′
	13.	Innaglur	2895	14° 2′	78° 5′
Madakasira	14.	Muthukuru	2650	13° 55′	77° 2′
	15.	Muthanahalli	3349	13° 55′	77° 6′
	16.	Madakasira hill	2934	13° 56′	77° 15′
	17.	Rollabetta hill	3247	13° 50′	77° 7′
Hindupur	18.	Yerrakonda	2817	13° 54′	77° 37′
	19.	Kudikonda	2673	13° 20′	77° 48′

Geology of the Anantapur District

By

Mr. V. D. Krishnaswami, M.A.

Morphology. The District of Anantapur may be divided transversely into three zones showing distinct physiographical features.

1. The southern taluks of Penukonda, Madakasira, Hindupur, and Kadiri. The portion included in the above parts is the most elevated and hilly part of the district. The country is fertile and is dotted with woods.

2. The central taluks of Anantapur, Kalyandrug and Dharmavaram. The scenery in these areas becomes more stern and bare, the greater part being a plain land. The country here is barren and desolate looking.

3. The northern taluks, comprising the Gooty and Tadpatri taluks, partake the characteristics of 1 and 2. The eastern portion is hilly but with no high peaks. The central and the western parts contain wide stretches of black cotton soil. The eastern part is the most fertile in the district. The Penner flows through the middle of the central plains.

1. The entire area covered under the southern and central taluks is divided by longitudinal parallel ranges with north-south strike, the most prominent of them being in order from west to east—(a) Ratnagiri Madakasira granite running north from the Mysore territory to Kalyandrug where the continuity is interrupted by several breaks, (b) Palasamudram-Penukonda-Mustikovila granite range with the unique Ramgiri Dharwar schist band. This range bifurcates itself into two ranges at Ramgiri, the two running on either side of Anantapur. The Tadakeleru and its tributary Pandameru rise in the northerly branch of this range and flow respectively into the Singanamalla and Anantapur tanks, and (c) the Mallappakonda range. It begins at Dharmavaram town and runs out of the district into the Mysore State, standing as a barrier all along between Kadiri and Penukonda. In the low country between (a) and (b) flows the Penner and between (b) and (c) drains the Chitravathi river, the feeder for the big lakes of Bukkapatnam and Dharmavaram and the tributary of Penner. The Maddaleru, a feeder of the Chitravathi, rises in the Mallappa-

konda range towards the Kadiri taluk and joins the main stream in the Dharmavaram taluk.

Madakasira is hilly and rocky towards the centre and the south but to the west more level. The highest peaks are Ratnagiri and Madakasira. The western side is more fertile and is aided by a better supply of water through many tanks and rivulets that ramify the taluk and drain into the Hagari. This is the most favoured region of the district standing as it does at a higher elevation receiving an ampler rainfall and possessing a red soil of superior fertility and thicker vegetation. All these natural advantages have led to the taluk as a whole being described as " the Garden of the district." Hindupur is in the main flat and is similar to Madakasira in point of natural advantages. Penukonda is very hilly as the very name indicates and contains detached dome shaped hills as well as clusters of them. The principal clusters are those at Palasamudram and Penukonda, the highest point here being 3091′ above sea level. Kadiri is very stony and barren and is cut up by detached rocky hills which are destitute of vegetation. The Maddaleru rises in and passes through the taluk and the Papaghni passes through its southern and south-eastern portions. The soil is of poor, coarse red earth mixed with disintegrated granite. Black cotton soil is however met with in patches here and there.

The undulating plains between the hill ranges of (*a*), (*b*) and (c) are always composed of the Archaean gneisses and their in situ weathered products, either regur or laterite. It is through the gneisses that the granitic hill ranges have intruded. Nowhere the rivers are much utilised for irrigation. Both Penner and Chitravathi traverse the Penukonda and Hindupur taluks in the same direction.

2. The tract of country in the central taluks is mostly plain land, leaving out the interrupted continuations of (*a*), (*b*) and (c) ranges mentioned in the southern taluks. Besides these, there are numerous examples of isolated peaks and rocky clusters, like the precipitous Kundurpidrug, the cluster roundabout Kalyandrug and the fine group north of Singanamalla tank and the hills just north of Malayavantam in the Anantapur taluk. The highest point in the Malayavantam group is Gampamalla hill 2510′ above the sea. The soil in the main is gravelly and of the poorest nature, being lateritic. The soil in the north of the Anantapur taluk towards Penner is black cotton. There is scarcely any vegetation, the country is barren and desolate looking. The large tank of Bukkarayasamudram at Anantapur taluk is fed by the Pandameru river. Dharmavaram is hilly on the three sides except the

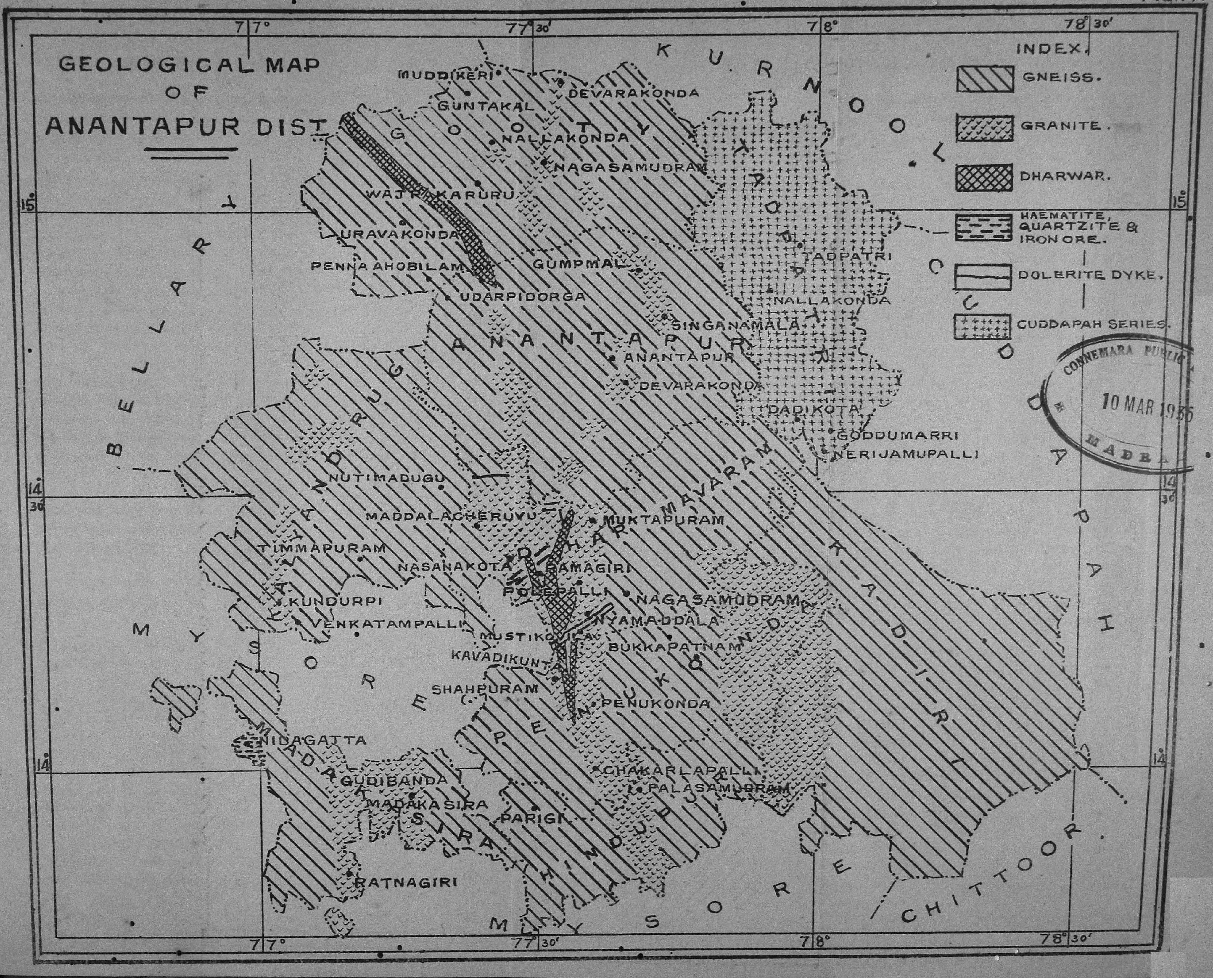
north, the soil is chiefly lateritic and there is little black soil. The only large tank at Dharmavaram has been formed by damming up the Chitravathi river. Here gold mining was once a thriving industry round Venkatampalli and Rampuram.

3. The northern part comprises Gooty and Tadpatri taluks. This region is drained by the Penner in a west to east direction. The eastern side as a whole is hilly towards Cuddapah. Along the eastern side of the Tadpatri taluk runs a portion of the Errakonda range of Kurnool. In the north between Tadpatri taluk on the one side and Gooty and Anantapur on the other runs the Muchukota range. It travels right across that part of the district from north of Gooty town down to the Chitravathi river which crosses the range at right angles and is some 35 miles in length and as broad as 7 miles in some places.

The north-eastern portion—Tadpatri—is an open plain. On either side of the river are wide stretches of black cotton soil, the most fertile in the district. There is hardly any laterite in the taluk. The greater part of the Gooty taluk is continuous with the black cotton soil region of Bellary. A number of detached rocky hills like Nallakonda, Devarakonda and Namellakonda are composed of a porphyritic syenite. A very hard handsome red micaceous granite forms the group of hills near Nagasamudram. The black cotton soil of the Gooty taluk in the west is fertile; but the soil in the north and east is red and gravelly. Wajrakarur is an important village in this taluk noted for diamonds. Diamonds are frequently picked up by the villages in the fields after rains. Some years back a stone was picked up which when cut and polished was valued at upwards of £ 10,000.

Orographical Elements. In studying about the physiography of the district as a whole, a note on the origin of the hill ranges may be made. The mountains that we see in our locality are all chiselled out of a plateau of erosion. Being at a higher elevation, it is subject to more active and intense erosion. Further, the prominent features of the land largely depends upon the lithological character and the geological structure of the underlying rock masses. The Deccan Plateau has not been subject to crustal deformation since the close of the Vindhyan era, an enormous lapse of time quite sufficient for the ever-active agents of erosion (the epigene forces) to show their activities. This alone would have been enough to account for the excessive denudation of the consequent furrowing and trenching into valleys and spurs. The original table land character is now hardly recognisable and

FIG. 14.



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the country as a whole has been converted into rolling uplands, into regular or irregular groups and masses of relict mountains, largely determined by the nature of the constituent rocks and the mode of their arrangement. The rocks of the valleys and plains in the district are all foliated gneisses into which are intruded dykes of granite, diorites and dolerites. The gneisses being the softer are easily accessible to weathering agencies and are pulled down. The intruded rocks—here granitic and doleritic—stand out as square-cut and steep-sided hills, being harder than gneisses. They show no axis of tectonic upheaval coincident with their present north-south strike in our district. What we at present see of them are but the deeply eroded remnants of the original plateau. Hence the hills of our area are typical of heights which have been moulded by epigene forces of weathering and may be truly styled as mountains of circumdenudation, i.e., they are the outstanding remnants or outlines of the old plateau of the Peninsula that have escaped the denudation of ages. Mountains of this kind are termed 'Subsequent or Relict type.' The hills of the district as well as the mountains of the whole Peninsula are examples of the Relict type.

Stratigraphy & Lithology

THE FORMATIONS AND ROCK GROUPS WHICH ENTER INTO THE GEOLOGY OF THE ANANTAPUR DISRICT ARE :—

Pleistocene—Recent.		Regur and laterite, the decomposition products of the gneisses that give rise to residual soils.
Purana—Cuddapahs.		The Papaghni Series of the Tadpatri taluk composed of sandstones, shales and slates with dykes and sills of contemporaneous lava flows.
—•— — — — — —		EPARCHAEAN UNCONCORMITY
Archaean	Dharwars	Penner-Hagariband Ramgiri-Penukonda Schist.
	— — — — — — — — —	
	The Archaean gneisses intruded by pink pistacite granite, both are traversed by dolerites and quartz reefs.	

UNFOSSILIFEROUS.

The Mysore Geological Department and the Geological Survey of India, surveyed the entire district, the former the southern portion south of lat 14°.30′ N. and the latter the northern part north of that latitude.

The crystalline and the gneissic rocks of the Archaean fundamental complex constitute the first and the oldest group and cover by far the largest area of the district. The rocks show a considerable variety of texture and composition. In the northern part of the Gooty taluk a porphyritic syenite forms a number of rocky hills like Nallakonda, Devarakonda and Namallakonda. A band of the same kind stretches southwards down to and beyond the Penner. A very handsome red micaceous granite forms the group of hills near Nagasamudram of the same taluk. In the Anantapur and Kalyandrug taluks by far the greatest part of the gneissic area is occupied by highly granitoid rocks which are also far more conspicuous than the well foliated gneisses. The gneisses are generally very little seen owing to the continuous sheets of regur which mantle them. Even the few outcrops of the gneiss within the area of regur are in too advanced a state of decomposition to allow anything but the roughest determination of their nature. Pink granitic gneiss is characteristic around Muddikeri, a few miles north-east of Guntakkal Station. The remarkable accessory mineral here is Pistacite. The rocks here have undergone considerable metamorphism so that they are often very hard to distinguish from veins of younger intruded granite. The porphyritic granite gneiss so largely developed to the westward of the Penner-Hagari band of Dharwar rocks, which traverses the Gooty taluk constitutes the typical 'Bellary Gneiss.' Pistacite is less common here. The colour of this fresh rock is purplish. The prevalent feldspar is a pink orthoclase. A variety of schistose gneiss is developed to some extent in the valley of Penner and to the south and east of Wajrakarur.

The geological features of the southern half of Anantapur comprised under the taluks of Kalyandrug, Anantapur, Dharmavaram, Penukonda Madakasira, Hindupur and Kadiri may be treated under the following heads as it has been done by the Mysore Geological Department on account of definite changes in the constitution of the rocks from west to east.

1. The Ratnagiri-Madakasira Range,
2. The plains west of this range,
3. The plains to the east of this range,

4. The Penukonda-Ramgiri Range,
5. The Penukonda-Ramgiri Schist belt,
6. The gneissic low country to the east of No. 4.
7. The Mallappakonda Range,
8. The Maddaleru basin enclosed between No. 7 and Seshachalam Hills to the east of the Kadiri Taluk.

1. The average width of this range is 10 miles. The hills in the eastern part of this range are composed of a pink granite, fairly coarse in texture and somewhat porphyritic. Intruded through this are various dykes and veins of fine grained purplish granite. The valleys between the peaks when not covered down by rainwash frequently show the foliated gneiss which flank the eastern and western borders. In the northern part of this range, a great number of doleritic dykes cross the country at right angles. The dykes are however absent in the Madakasira taluks.

2. The plains to the west of Number 1 (west of Madakasira) are entirely gneissic. At Nidaghetta there is a large Quartz Haematite schist resting on the gneiss.

3. The plains to the east of No. 1 which are drained by the Penner (western portion of Hindupur and Penukonda) are composed of much metamorphosed and banded gneiss. The gneiss throughout this north-south strip of plain country contains a large number of thin runs hornblende and schist dipping and striking parallel to the gneiss. The whole country is intersected by micro-granitic veins and pegmatites. Towards the north, near Somavandlapalli in the Dharmavaram taluk doleritic dykes are very abundant.

4. The Penukonda-Ramgiri Range is also a huge granitic intrusion. The highest point culminates in the Nundydrug Hill of Mysore State. The boundary of this intrusion is very irregular and it is difficult to distinguish the mottled granite at its edges from the foliated gneiss which flanks it. The other important peaks of this range are Kavadi Konda and Nasankote. A great variety of rocks exist in this range. The granite is pinkish, of fine grain and contains a large number of included gneiss. The variation becomes more pronounced at Nasankote where the granites and diorites are noticeable together. The outcrop of this range at the Kalyandrug-Dharmavaram road is distinctly of a dioritic type. All these varieties of granite contain the green mineral epidote. Further, the range is traversed by east-west

doleritic dykes running for several miles in a parallel manner and forming a capping to all the peaks. They are all so regular that they cause the range to appear to be running east to west whereas in reality the actual run of the granite is north to south. In this locality the dolerites are much harder than the granites which they intrude into.

5. The Penukonda-Ramgiri Schist Belt. This division contains essentially the Dharwar Schist Band intruded by tapering runs of granite with broader portions to the north. This is better described under the Dharwars of the district.

6. The parts of Hindupur and Penukonda lying in this low country is chiefly made up of mylonitic gneiss with lateritic caps in the south. Through this territory flows the Chitravathi river. The eastern portion is bordered by the confused range of Mallappa Konda (No. 7) formed essentially of granite gneiss with minor intrusions of pink granite.

8. The area enclosed between the Seshachalam Hills and No. 7 forms the Kadiri taluk and the country as a whole drains into the Maddaleru. The prevalent rock is the gneiss with intrusions of granite that form the detached rocky hills. A small amount of Dharwar Schist occurs in the form of long strings. Haematite is confined to these strings and was used in olden times to be smelted by the primitive native processes.

Dharwar Rocks. Rocks of this system are very varied in kind but schistose varieties predominate and give a marked character to all the tracts they occupy. Another peculiarity regarding their mode of occurrence is that they occur on narrow elongated synclines as outlines in the Archaean gneiss; consequently they received a great deal of compression and are preserved in the synclinal troughs.

Of the eight Dharwar bands so far recognised the Penner-Hagari band is the one that enters into the north-west corner of the Gooty taluk from Bellary. After crossing the Bellary territory, it runs nearly south-east for 24 miles towards Penner, where it trends south and south by west for 22 miles; beyond this it was not mapped. To the east and south-east of the point where it crosses the Penner are a number of outliers of Dharwars which represent so many parts of foldings which have been caught down into small faults in the Archaeans. There might have been a connection between this band and the Penukonda-Ramgiri Schist belt.

The nature of the rocks forming the Penner-Hagari band is chloritic schists of dark green colour. The schists are highly metamorphosed and traversed by large dykes of greenish diorites. The boundaries are everywhere concealed by black cotton soil. Too little of this band is exposed in the Gooty taluk to enable one to explain the position it occupies with reference to the underlying gneiss. Near the Penner it certainly appears to hold the position of a synclinal fold sunk in the gneissic rocks, the beds composing it being tilted up vertically in parts and generally showing very high angles of dip.

The next important band is that mentioned under item 5. This is known as the Penukonda-Ramgiri band intruded by tapering runs of granite. The schist belt commences close to the village of Chakarlapalli in the Penukonda Taluk and goes up to the Dharmavaram-Kalyandrug road, a distance of over 30 miles varying in width from half a mile in the extreme south to 4 miles at Mushtikovila.

It has a central direction of 10° west of north. The eastern border is much branched due to peg-shaped intrusions of granite. The main mass of the schist belt consists of a black fissile fine-grained hornblendic rock forming one half of the eastern side of the main mass and the whole of the easterly branch of Devarakonda (Penukonda Taluk). The western portion is composed of argillites. Chlorite schist is almost wanting south of Mushtikovila but forms the most prominent rock of the thin branch west of Ramgiri. Haematite quartzites form several well-marked bands in the schist, east of Ramgiri and near Polepalli. Limestone and calcareous schist are present as irregular thin runs between hornblende schist and fissile argillites. On the high ranges west of Ramgiri, the schists alternate with white quartzites.

The rocks of the schist belt appear to be of two distinct ages; the chief reason for assuming this is that the east-west dolerite dykes which invariably penetrate the hornblende schist and the haematite quartzite are never continuous into and across the argillites. The beds constituting the belt are folded into several sharp anti- and synclinals but no continued repetition of beds outside the limit of each synclinal fold was observable. Mr. E. W. Wetherell, the the Mysore State Geologist, in writing the report in 1905 on this belt expressed as follows:—"The general appearance of the whole country would point to the schist at present existent as a remnant of a much larger belt which has been intruded by

granite, which is now found occupying the eastern and western borders of the whole belt and as intrusions through it."

Intrusive Rocks. These form an important feature in the landscape of many parts of Anantapur and cannot be overlooked in a brief description of its geology. They are of two classes .1. Trappean and 2 Granitic. The latter is in all probability the older. The granitic intrusions have been widely treated in the discussion on gneisses. The principal seat of occurrence for them is in the rocky hills lying west of Gooty. The granite gneiss is cut up by red pistacite granite in very irregular veins of all sizes.

The trappean dykes are of very common occurrence and traverse all kinds of rocks—the gneisses, the intruded granite and the Dharwar schists.

Quartz reefs, the super-acid phases of granites and pegmatites are very common in the neighbourhood of Anantapur and Gooty. Two very conspicuous reefs form the crests of Tellakonda and Ragulpad ridges near Wajrakarur.

The Tuff Agglomerate at Wajrakarur-Gooty taluk.—This is a remarkable formation of agglomerate tuff in a 'neck' piercing the epidotic granite lying west of Karur. The neck is of considerable size and covers an area of several acres but is much obscured by the gneissic debris. This is the locality where diamonds are picked up by the villagers in the fields after rains. Though the nature of the agglomerate tuff is similar in character to the Kimberley blue ground, no trace of carbon has been found here and the question whence the diamonds of this locality came from will ever remain a mystery. The age of this tuff is fixed in the Dharwar times when violent volcanic eruptions and tectonic distrubances took place.

The Cuddappah System. The north-eastern part of the district, covering the entire Tadpatri taluk is occupied by the deposits of the above system. The rocks rest with a great unconformity on the Archaean gneisses of this taluk and carry the lower groups of this system which make a great semicircular band extending from north-west and north from Kurnool to Cuddappah. The Muchukota range forms the westerly limit of the cuddappahs; and the succession of formations occurring here agrees with that seen in the Pulivendla taluk of Cuddappah. The rocks are mainly composed of sandstones followed by slates and shales with a few limestone layers in the shales. Contempora-

neous lava flows in the form of dykes and sills had metamorphosed the limestones into marbles, talc and serpentines. Besides they contain banded cherts and jaspers which are often picked up in the river gravels of Chitravathi and Penner. The rocks possess low angles of dip and therefore were free from voilent volcanic disturbances that characterised the Dharwars. Five miles N. E. of Tadpatri, there is a small tract of Banganapalle quartzite capped by *Narji limestone* (of the Jamalmadugu group—Kurnool system), which is of interest as being the most southerly point at which the diamond beds occur. No mining operations seem to have been attempted here.

Pleistocene Deposits. The sub-aerial formation of this age are laterite, regur, the sand dunes on the banks of Penner near Tadpatri and the travertine rocks of the Kona-Uppalapadu Valley. Laterite and regur are the residual soils got by the disintegration of gneisses and schists *in situ.* Regur or black cotton soil is a highly argillaceous fine-grained soil with calcium and magnesium carbonates and a very large admixture of organic matter. The dark colour of the soil is attributed to the organic matter. The soil is credited with an extraordinary degree of fertility. It is extremely sticky when wetted. Laterite is red in colour and vesicular in structure and rich in iron and aluminous oxides. The origin of regur is ascribed to long continued weathering of feldspathic gneisses of an area, which would result in a clayey residue and which by impregnation of decomposed organic matter resulting from jungle growth over it could assume the character of regur.

Sand Dunes. To the west of Tadpatri town are a series of dunes, some of which are as much as 60 feet in height. The sand has been blown out of the river bed by the strong winds of the south-west monsoon blowing through the valley during the hot weather months. These have encroached upon and ruined the wet land adjoining.

Travertine. At the mouth of the valley in the Erramala hills, near Yadiki is an overhanging cliff. Underneath this runs one of the perennial springs which passing over a series of small ledges of rock forms a little waterfall (*kona*). The cliffs in this place are an interesting example of recent travertine deposited on the scarp of older rocks by the perennial streams flowing from a more elevated plateau of the *Kurnool Limestone.* The travertine caves carved in these cliffs are studded with numerous stalactites. Fresh water shells and leaves of existing species have been en-

countered by travertine and their impressions are well-preserved. The lime dug out from this is particularly white and soft and much used for building purposes.

General Geological History. The oldest Archaean gneisses, have been designated as the 'fundamental gneisses' as they form the basement for all the later rocks. The gneisses are extremely folded and metamorphosed, and intruded by granitic and doleritic dykes. In field relations the gneiss differs from ordinary instrusive granite only in the enormous area which it occupies. The texture of the rocks vary widely, from a coarse holocrystalline rock to a *felsite* with a texture so fine that they appear quite homogeneous to the eye. The gneiss is believed to be to some extent the first formed crust of the earth by the consolidation of the molten globe. Though the Archaean rocks are classified into well-defined groups, they do not represent any definite succession in time.

The Dharwar Schistose rock, like the argillites, phyllites, seen in the Penner-Hagari band and the Ramgiri-Penukonda schist band, had been formed from the earliest sediments, yielded by the weathering of the older Archaean gneisses. Their sedimentary nature has been completely obliterated by the great degree of metamorphism induced by the tectonic disturbances that marked the close of the Dharwar era. The hornblendic and the chloritic schists are held to be the metmorphosed basic lava flows of these times. The real origin and correlation of the Dharwars to the Archaean gneisses are still unsettled questions.

The formation of the Cuddapah rocks discloses the presence of a sea in the Cuddapah area where sedimentation was going on, the material for which had been derived from the waste of the Dharwar land caused by epigene forces. It is on the deeply denuded edges of the Dharwars and the Archaean gneisses that the basement strata of the Cuddapahs rest with unconfirmity. The Cuddapah rocks have in general low angles of dip and enormous thickness of sediments. These conditions indicate the absence of any violent tectonic disturbance since Post-Dharwar times and a slow and quiet submergence of the basis of sedimentation as fast as they were filled.

'Since the close of the Vindhyan era, succeeding the Cuddapahs, sedimentation had ceased and the great *epirogenic* uplift at the close lifted the entire peninsula from the present day. This is the reason why no fossiliferous younger formations were

not recorded in the peninsula, more particularly in the Deccan Plateau.

Economic Geology. Anantapur district cannot be regarded as richly endowed with deposits of great commercial value. Many important industries like gold-mining, diamond-mining and iron ore-mining have all become defunct. Nevertheless the country possesses potenial sources of wealth in its building stones, steatite and barytes. These are the principal economic materials and along with gold and diamond are treated below.

Building Stones are distributed throughout the district in great profusion and variety and many of them are suitable for the best class of architectural and decorative work. The pink pistacite granite near Gooty is a valuable building stone and has in the past contributed material of excellent quality for the buildings of numerous temples and other edifices of South India and even in the fortress at Gooty.

Barytes occur in veins, the largest of which is from 3′ to 11′ wide in the Vaimpalle slates and limestones belonging to the Papaghni Series of the lower Cuddapahs near Nerijamupalle. Another outcrop occurs in the Dadikota reserve forest near Nerijamupalle, Tadpatri taluk. The colour of the Barytes is generally white, varying to light green and faint pink. The deposits are not worked because of the absence of any demand for the mineral.

Steatite or Talc occurs in the Gulmari Village, Tadpatri taluk; also found at Goddumari in the same taluk along with serpentinous limestone. The colour is yellowish white and greenish, structure compact and cuts easily in slices. This is a good serviceable stone and gives a fair lubricating powder. This is also carved into bowls, plates and vases at Rayalcheruvu.

Corundum is reported to occur at Parige near Hindupur; in several places in Madakasira taluk; at Siddarampuram, Atmakuru and Timmapuram in Anantapur Taluk; at Maddalacheruvu and Sivapuram in Dharmavaram; and at Nutimadugu, Manirevu in Kalyandrug. In all these places the corundum occurs *in situ* in the coarse grained gneisses in small round grains and in large crystals measuring some inches in size. It is only mined spasmodically and on a very small scale.

Haematite. The haematite quartzites occurring in the Dharwar Schists were once exploited to be converted into iron by charcoal fuel got from the forests. This industry is nearly extinct

but still lingers at Kamalapuram (Bellary). This charcoal iron industry may revive, if the forest conservancy energetically succeed in re-afforesting the depleted forests and reduce the price of charcoal.

Limestone is seen to occur in a layer 3 feet below the regur soil in the Gooty and Tadpatri taluks. This is highly concretionary and kunkarous. When quarried it is white and soft and is in great demand for local building purposes.

Diamonds. Although no statistics are available, private reports indicate that every year a certain number of valuable diamonds are picked up after showers of rain in the neighbourhood of Wajrakarur, in the Gooty taluk. The neck of agglomerated tuff has been thoroughly bored and tested for probable origin of diamonds but the results were highly disappointing and do not show any indication of origin.

Gold occurs in the quartz reefs that traverse the Dharwar Schist in the Ramgiri-Penukonda Schist belt. Near the village of Ramgiri are found old gold workings. The gold is essentially seen in those quartz veins traversing chloritic and argillaceous schists. Company after company was floated since 1905 and all mining operations were ceased in 1924. The mines were all situated in the Dharmavaram taluk. The villages where gold was extracted in this taluk are Rampuram and Venkatampalli. During the quinquennium 1919-23 44,678 ounces of fine gold were produced. Ancient gold workings were discovered in the Gooty taluk also. After 3 years of work since 1925 mining operations were permanently suspended. The total amount produced from Anantapur in the last quinquennium 1924-1928 was 7,259 ounces.

Cuddapah slabs are quarried from the Tadpatri taluk and are mainly used as flooring slabs. This is a shaly limestone.

Slates are reported to occur in the Tadpatri taluk and are remarkable for their size, smoothness and fissility. They find a market in the form of Madras writing slates. They were exhibited in the industrial exhibition of last year attached to the Park Fair.

Soils. The soils of Anantapur form by far the most unimportant economic deposit. They are essentially composed of black cotton soil, the weathered products of the Feldspathic Archaean gneisses. In the northern taluks of Tadpatri and Gooty, the black cotton soil is highly fertile. The central tract is the least

fertile and is composed of red loamy soil. The southern taluks are the most fertile of the district, the soil is composed of either laterite or regur in patches. The fertility is due not entirely to the soil but to the peculiar coincidence of climatic conditions and physiographic features. The laterite cap is everywhere infertile. The black cotton soil is not used for any wet cultivation. Its inferiority is attributable to its salinity and to its water clogging nature during the monsoon times.

Conclusion. In closing this sketch of Anantapur Geology certain facts have to be borne in mind. Firstly the area under consideration, in the words of Mr. W. Francis is "neither a geographical, historical nor ethnical entity but the product of administrative convenience and its accidents." The most recent of these is the addition of the Kadiri taluk from out of the Cuddapah district, an act which adds nothing to its homogeneity."

The geography of the district forms part and parcel of the entire Deccan Plateau region. A back sight from the Anantapur District towards the south in the Mysore Plateau exemplifies in a remarkable manner, the longitudinal continuation of the various hill ranges mentioned under the southern taluks. In the central taluks of the district their continuity is interrupted and their central north-south direction becomes altered. But for a look on the map (Sheet No. 57 and 66 of the Survey of India) one is apt to fail to obtain a true perspective of the hill ranges.

The rock formations are simple and few; but their field relations have evoked interesting questions on their mode of occurrence and origin. Diverse are the views formed by many geologists about them, but none of them is to be taken as the last word but have to be accepted as partial truths throwing light in the contexts in which they occur.

The names of hills possess a legendary interest about them. They are either suggestive of historical facts or based on the colour of rocks forming the hills. A few examples of the latter kind are—Nalla konda, Tella konda and Erramala. From the names alone we can obtain roughly an idea of the nature of the rocks. Nallakonda brings into one's mind the dolerite dykes so common in our area, the word Tellakonda that of quartzites and lastly Erramala that of laterite.

Lastly, inasmuch as the waters of the rivers are not perennial and the monsoons bring in but a meagre supply of rainfall, the soils of the various parts of the district should be studied with

a view to their capacity for retaining good underground water currents. The Government is doing this work in right earnest to supply the people with good water through wells. It is a matter of experience that environment brings into play certain traits in men which in other circumstances would lie dormant or entirely wanting. During summer times, the people are forced to dig out deep trenches along the hill streams and nullahs to reach the perennial underground water currents in certain localities and thereby relieve their water necessity to some extent. In writing this paper, it has come to my notice that a band of well diviners are obtaining employment in this district to divine the water current underground for which they expect to be paid before-hand whether the parties succeed or not at the particular points they fix. Instead, if a thorough research of the soils from this view-point is made by competent and practical geologists, it will yield better results that are open to scientific examination.

The Meteorology of Anantapur

By

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The district of Anantapur was formerly a part of the Bellary district from which it was separated in the year 1882 and hence it is not a geographical unit. It is bounded on the east, north-west and south by Cuddapah, Kurnool Bellary and Chittoor districts respectively and on the south and part of the west by the Mysore State. The district is made up of nine taluks. Gooty and Tadpatri in the north, contain large areas of black cotton soil; Anantapur, Kalyandrug, Dharmavaram and Penukonda in the middle and Kadiri in the south-east are mainly made up of arid expanses of poor red soil without much vegetation; Madakasira and Hindupur in the south which are connected with the Mysore plateau and stand at a higher elevation than the rest of the district are more fertile than the others. The district on the whole is mostly barren and there are no hills of any great size. The level of the district has a gradual fall from the south up to the valley of the Penner in Gooty and Tadpatri taluks, after which it rises slightly once more. In Hindupur and Madakasira, the average elevation is above 2000 feet. Anantapur and Gooty stand at about 1100 feet while Tadpatri is only 900 feet above mean sea level.

Since no systematic meteorological observations are made in the district, we have no official records of the pressure, the temperature, the humidity, and the direction and velocity of wind in this part of the country. But the climate closely resembles that of the neighbouring district of Bellary.

The three hottest months in the year are March, April and May during which the average maximum temperature is between 99° and 104°F, and the average minimum between 71° and 78°F. In June, after the onset of the south-west monsoon, the maximum drops drown by five or six degrees and then decreases slowly every month until December when it registers about 85°F. The average minimum also decreases gradually to about 61°F. Madakasira and Hindupur, due to their higher altitudes, are the coolest of the nine taluks.

During the south-west monsoon, from June to August, very strong winds blow over the district from the south-west. In August and September, the wind turns round to the north-west. In October and November, the wind is from the north-east. From December to March, there is light south-east wind.

Anantapur is one of the dry districts in the presidency. The average annual fall is about 27 inches. Though the district lies midway between the two monsoons, it does not derive the benefit of either. As it is too close to the Western Ghats it does not receive much rain during the south-west monsoon and the north-east monsoon current leaves behind most of its moisture before reaching the district. There are three distinct rainfall zones in the district. Anantapur, Dharmavaram and Kalyandrug in the centre are the three driest taluks ; more rain is received in Gooty and Tadpatri ; the taluks in the south receive the largest amount of rain.

From December to March there is practically very little rain, the average then received being less than one inch ; in April and May, there are a few showers ; with the onset of the south-west monsoon in June and July, much rain is received till the end of the north-east monsoon in November. The heaviest fall is during September. The total number of rainy days in a year is 103, while that of Bellary, Kurnool and Cuddapah are 84, 135 and 157 respectvely. The heaviest fall on record was in 1874 when 38.6 inches of rain was received. The lightest was in 1876 when the average fall was only 6.9 inches. According to Williamson and Clark, Anantapur lies within the zone, where the variability of rainfall is from 25 to 30% ; and this high percentage of variability shows that rainfall is very uncertain in this district.

Fig. 1. The maximum temperature is reached during April in Anantapur and Bellary, while in Cuddapah and Kurnool during May. The highest maximum is recorded at Cuddapah and the lowest at Anantapur and Bellary. In all the four places, there is a sudden drop in the maximum during June and July, and October and November, showing the effect of the monsoons. In October, there is a slight rise in the maximum at Kurnool. The lowest maximum for the four stations is during December and of all these the maximum at Anantapur is the lowest. From January to May, the maximum at Anantapur is the lowest. From May to July, the maximum at Bellary is the lowest. From July to October, the the maximum at Kurnool is the lowest. From October to December

Fig. 1. (15)

MONTHLY MARCH OF MAXIMUM TEMPERATURE

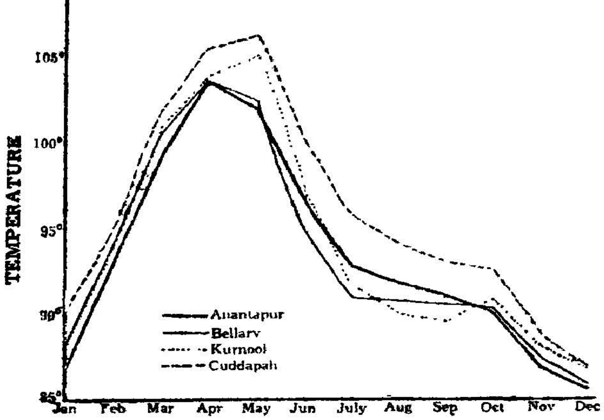


Fig. 2. (16)

MONTHLY MARCH OF MINIMUM TEMPERATURE

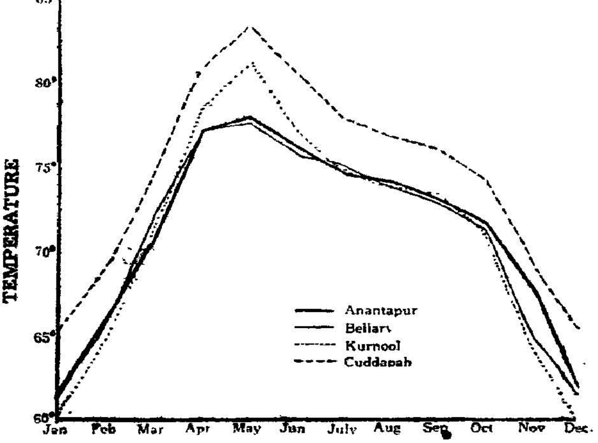


Fig. 3. (17)

MONTHLY MARCH OF RELATIVE HUMIDITY

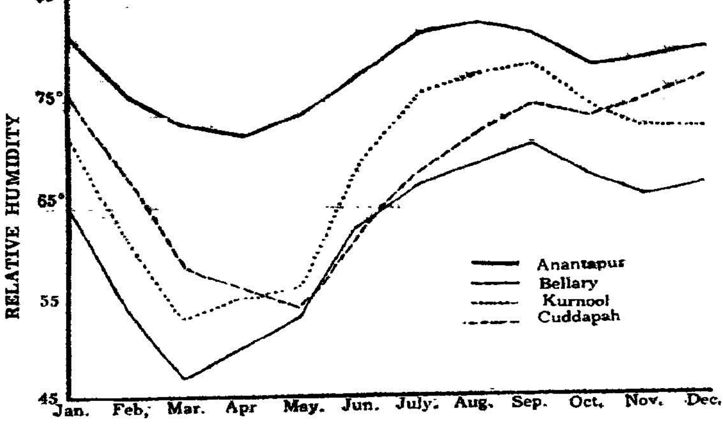


Fig. 4. (18)

MONTHLY MARCH OF PRESSURE AT BELLARY

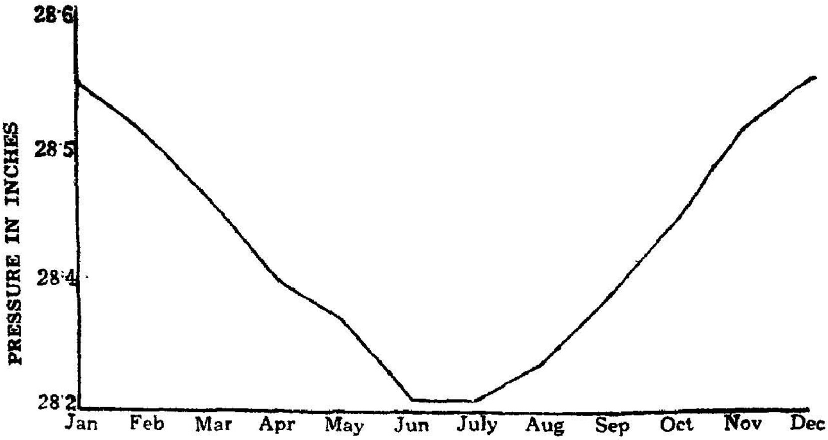
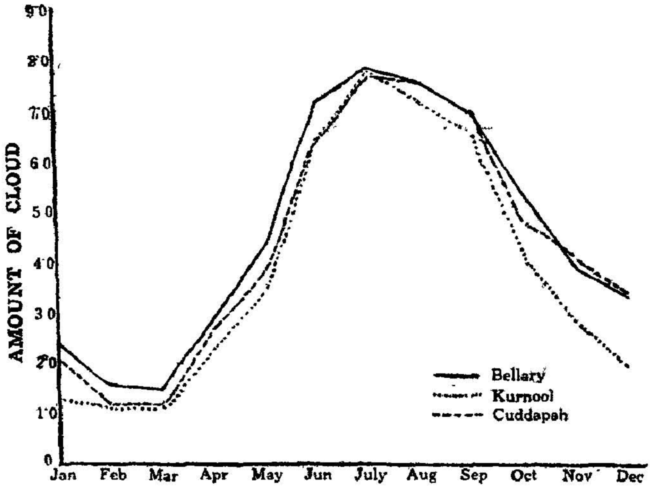


Fig. 5. (19)

MONTHLY MARCH OF CLOUDINESS



again, the maximum at Anantapur is the lowest. The maximum at Cuddapah is the highest throughout the year.

Fig. 2. The highest minimum is recorded during May in all the four places and the lowest minimum during January at Anantapur and in December at the other places. Of these, the minimum recorded at Kurnool is the lowest. From January to March, the minimum at Kurnool is lower than those at the other three places. From March to July, the minimum at Bellary and Anantapur is lower than the other two. From July to October, the minimum at Bellary, Anantapur and Kurnool are nearly equal and from October to December, the minimum at Kurnool is the lowest.

Fig. 3. The relative humidity at Anantapur is the highest of ively. The heaviest fall on record was in 1874 when 38.6 inches of The maximum humidity is during August at Anantapur, during September at Kurnool and Bellary and in December at Cuddapah. The lowest humidity is during March at Bellary and Kurnool, during April at Anantapur and in May at Cuddapah.

Fig. 5. Bellary is more cloudy than the other two districts and Kurnool is the least cloudy of the three. The maximum cloudiness is during July and the minimum during March in all the three places.

We have no data for the atmospheric pressure and cloudiness at Anantapur.

Amount of Rainfall at Anantapur.

Month.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Amount.	0.12	0.49	0.22	0.41	2.40	2.01	4.51	2.84	8.31	3.05	2.83	0.18	27.37

Forests of Anantapur District

By

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Distribution.—The area of the forests in the district is 704 square miles forming 12 per cent of the total area of the district. The great majority of the reserves occur on the hills which run roughly north and south of the district in five more or less well marked lines, viz., Muchukota and Nagasamudram ranges running through the northern half of the district, Mallappakonda, Penukonda and Madakasira ranges running through the southern half. A few of the reserves occur on the detatched cluster of hills round Kalyandrug.

Relation to climate and character of vegetation. The forest growth in general is of a very poor quality. The climatic conditions prevailing in a locality are of great importance in determining the type of its forest vegetation and it will not be out of place to give a brief sketch of these conditions.

The district is one of the driest in the Presidency with an average annual rainfall of 22 to 23 inches. The South-west monsoon which is very capricious and uncertain contributes the greater part of this scanty rainfall, whereas the North-East monsoon leaves behind most of the moisture before reaching Anantapur.

The central part of the district is the driest, and the rainfall in the southern parts is higher than elsewhere in the district, ranging from 23 to 28 inches annually. The hottest period is February to April when every blade of grass is scorched to tinder and so far as the forest vegetation is concerned these dry hot months are the most critical ones, in that they mark the season of forest fires exercising a considerable influence on the constitution and type of the forest.

Thus the tract, being of a very arid nature, supports a degraded type of fuel forests which in parts are merely low thorny scrubs. In the northern and central parts of the district the conditions for forest vegetation are still more adverse, as the soil in the hills of

these parts is extremely shallow with extensive out-crops of sheet rock. As a result, the forests on the Nagasamudram hills in Gooty Taluk, and Muchukota hills in Tadpatri taluk mostly consist of scattered thorny bushes of such species as Randia dumitorum, Carissa carandus, Acacia sundra, Euphorbias and in places stunted growth of Albizzia amara, Dolichandrone crispa and Dodonaea viscosa.

The south stands at a higher elevation and gets more rainfall and the soil is richer and deeper, and as a result the forest vegetation is comparatively of better quality. The best of the forests both in point of growth and density are those on the Mallappakonda hills round Bukkapatnam and Amagondapalayam, and contain fair patches of Hardwickia binata, Anogeissus latifolia, Chloroxylon Swietenia, (satin wood), Terminalia tomentosa and also some stunted teak. But these trees do not grow to their normal dimension to yield any large sized timber, and are only fit to be used as posts, rafters, wall plate etc. A good deal of the growing stock is unsound, crooked and mutilated on account of annual fires, overgrazing and indiscriminate hacking of the adjoining villages in the past. Bamboos are also found to some extent on the hill tops. Sandalwood introduced artificially is also coming up well in the reserves round Amagondapalayam. On Penukonda, Madakasira and Kadiri groups of hills the growth is less varied and valuable, and usually consists of Albizzia amara, Dodonaea viscosa, Acacia sundra and Cassia auriculata with occasional sandal and bamboos.

Agricultural and domestic requirements of people. The surrounding villages are mainly agricultural and their chief forest requirement is grazing. For plough cattle they collect fodder grass in the reserves, the removal of which is permitted free. The grass is mostly of inferior quality and the Forest Department is experimenting to introduce a better type of fodder grass.

The requirements for agricultural purposes are ploughs, plough shafts, handles, harrow pegs, harrow handles, tool handles etc.

The wants of the people for building purposes are very meagre, as they live in huts and mud-roof houses, for which only small sized timber for rafters, posts etc., is largely required.

Apart from their ordinary domestic and agricultural requirements for timber, fuel, thatching and fodder grass, grazing and

numerous minor products, the people are largely dependent on the forests for their very existence in times of famine.

Sources of income. As already mentioned that none of the reserves of the district contain growth of any real size or density, the receipts from the sale of timber are negligible, and the bulk of the revenue is realized from the grazing fees and the sale of minor forest produce such as tanning barks (chiefly Tengedu—cassia auriculata), Beedi leaf, (Diopyros melanoxylon), soap nuts, honey, Tamarind and myrabolams.

Management. In 1926 all the poorer class of forests were handed over to village Panchayats and only such reserves were retained under the control of Forest Department that could be advantageously managed for the production of wood and other produce for local consumption and for grazing, and as also those the preservation of which is essential on climatic and physical grounds. There is now in this district a forest area of 445 square miles under the Panchayat management, and only 259 square miles under the control of the Forest Department.

The Panchayats manage their forests chiefly for grazing under the supervision of the Revenue department. The income derived from grazing and other minor forest produce is utilized by them for constructing and improving ponds and wells, and to some extent in the improvement of forests.

The forests under the control of the Forest Department are those which occur on the Mallappakonda and Kadiri hills comprising two Forest ranges of Bukkapatnam and Kadiri. These reserves are managed under a working plan with the following objects in view.

(a) To improve both the quality and the quantity of the existing growing stock in the economically workable areas by cutting back the damaged stock.

(b) To meet the local demand for fuel, small timber, bamboos, grazing etc.

(c) To work other items of forest produce for revenue.

(d) To increase the value of the forests by introducing sandalwood in all the reserves suitable for the purpose.

(e) To improve the general condition of the forests by regulating grazing and fire protection.

Coupes are worked annually for fuel, small timber, and agricultural implements and the different felling series are so arranged as to meet the local requirements. The coppice growth resulting from the cut back stock and the existing natural regeneration are supplemented by artificial regeneration by introducing more valuable species at suitable burnt patches. This along with protection from fire and grazing gives good promise of better growing stock for future.

Sandal propagation centres are being annually established in all the reserves with a view to increase the proportion of this valuable species in the reserve forests.

Agricultural Geography of the Anantapur District

By

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The District. The District forms part of the extensive Deccan plateau and is situated in the extreme south of it. The country consists of wide plains barren and desolate, interspersed here and there by low ridges, lines and clusters of hills. The land slopes from the south to the north till the valley of the Penner and gently rises again and is elevated in the west in Madakasira, Kalyandrug and the western part of Gooty Taluks.

The Soils. The surface of the land is made up of old and hard crystalline rocks. The alluvial and other formations are of very little significance. The soils fall into two natural divisions, (a) Black Cotton soil and (b) Red soil. The black cotton soil exists in the northern Taluks, Gooty and Tadpatri. It is very soft and sticky and retains moisture exceedingly long. It is an admixture of organic matter and carbonate of lime and possesses certain minerals which give it the peculiar colour. The red soil which occupies the major portion of the District is not of the same quality throughout. A kind of red sandy loam is found in the central Taluks, Anantapur, Kalyanadrug, Dharmavaram, Kadiri and Penukonda, where it ranges from 45% of the total area in Anantapur to 70% in Kalyanadrug. The best of this variety we find in the most southerly of the Taluks Hindupur and Madakasira where there are numerous gardens of cocoanut and areca-nut palms, and many other fruits. It is for this reason perhaps that this part of this District has been rightly called 'the garden of the District'. But even here there are scattered patches of poor red soil.

Climate and Rainfall. The District is far remote from the influence of the sea, and hence has got wide ranges of temperature. In summer the maximum goes up to nearly 104°F. while in winter it falls down to even as low as 55°F. The rainfall is very scanty between 21 and 22″ and even this falls in light showers, working on an average to half an inch per day in the rainy season. There are fairly three distinct zones ; the driest Taluks are in the centre ; the

southern Taluks, Penukonda, Hindupur and Madakasira get 22 to 23" and Gooty and Tadpatri in the north only about 22".

Irrigation. The rivers of this District are many of them torrential streams and are of very little use for purposes of irrigation. The other sources are entirely dependant upon rainfall which is always capricious and uncertain. Out of the total cultivated area in the District 3% is watered from the wells, 4% from tanks and 2% from channels. Gooty and Tadpatri have the smallest protected area while Penukonda, Hindupur and Madakasira have the largest.

Agricultural Live-Stock. As regards the agricultural live-stock it is to be said that there is no scientific breeding in the District. Only in Pamdurthi there is an apology of a good breed of cattle. The majority of the working cattle are imported from Nellore and Mysore. Every year travelling vendors tour round the District selling bulls and other animals, the purchase money being received by small instalments. Sheep and goats are grazed in large numbers in pasture lands for the sake of manure and the wool that is obtained from them. Cattle diseases such as Rinderpest, Anthrax, and Foot and mouth disease are frequently prevalent. The Veterinary Department has established three hospitals, and appointed touring surgeons in almost all the Taluks who are doing the best to improve the breed of cattle and prevent cattle diseases and mortality.

Population and Agricultural Holdings. Though the area of the District is very large, aridity, deficient rainfall and general poverty of the soil are its chief characteristics. The density of population being only 156 per Sq. mile, there is plenty of land available for cultivation. Hence about 75% of the population are engaged in agricultural and pastoral pursuits, and the pressure of population is greater in the rural than in the urban areas. The average size of holdings in this District is 10.8 acres with an assessment of Rs. 7-9-0, according to the latest statistics and this is specially notable in black cotton areas.

Agricultural Practice. Agricultural methods may be classified under two heads, wet cultivation and dry cultivation. They vary in this District according to the character of the rain-fall and the soil. Wet crops are raised only on 8% of the total area cultivated as the sources of water supply are not always protected and reliable. Sometimes dry crops are grown on wet lands for want of water. The chief wet crops are paddy, ragi, sugar-cane and betel, the last two being very little.

Paddy is raised largely in the Taluks of Anantapur, Kadiri, Dharmavaram and Penukonda. The cultivation is begun early in July with the setting of the south-west monsoon, or later in September in the event of its failure. The process is defective in many respects. The ground is not ploughed before being soaked with water, the seeds are sown broadcast, and in almost all places transplantation is not done. This results in the lengthening of cultivation, wastage of seed, and uneven crop.

Ragi which is an irrigated as well as a dry crop is grown to a large extent in Hindupur and Madakasira. As it requires less water than paddy it is a favourite crop under wells.

Sugar-cane is raised in Hindupur Taluk more for chewing purposes than for the preparation of Jaggery. A small quantity however is pressed and jaggery is manufactured in a village called Manchepalli, which is considered to be of a very high quality. The method of plantation is peculiar to this District. Instead of cuttings from the tops alone, cuttings from the whole cane are taken and planted in long furrows with trenches between them filled with water.

Betels are planted on level ground as usual but are given less water than considered necessary. Black betel which is less sweet and pungent is a very common variety and the vine differs with the nature of the soil.

Dry cultivation is adapted to the nature of the soil, red or black. In the red soil the cultivation is begun in June or July, the chief crops being Ragi, groundnut and castor. If the south-west monsoon is a failure horsegram, Cambu and Korra are sown as the hingari crop. Horsegram requires little moisture and comes into maturity with the heavy dews of winter. In ordinary years there is no hingari cultivation in this tract. In the black soil the cultivation is started just in the same months as elsewhere. Korra, Yellow Cholam mixed with pulses are sown as the Mungari crop. By the end of September or October cotton is sown mixed with cholam as a hingari crop. Even here ground-nut has replaced Korra as a mungari crop on account of its increased market value.

There is not much difference in manuring between wet and dry lands. Cattle manure is generally used. Sheep and goats are penned in the wet fields and green leaves are ploughed when the land is wet. Other manures, such as municipal sweepings, indigo waste, and refuse from the Gooty tannery, and castor cake are also used by rich land-lords. The milk bush and the Kanuga

leaves are among the best of the vegetable manures. In Madakasira even patta lands are planted with Kanuga trees and the owners derive great benefit therefrom.

Though the methods and implements are primitive in general and usually the same as in other places, those with regard to dry cultivation deserve special mention. The guntaka and the gorru are two implements peculiar to this District. The former is used for removing the stubbles and the latter for seeding purposes. The gorru is not at all known north of the Krishna and in the Tamil Districts except in the adjoining ones. It secures even sowing at uniform depth, economises seed, and permits of weeding by bullock power. Very heavy wooden plough weighing sometimes as much as 230 to 350 lbs are used especially, when bringing waste lands under cultivation. Nowadays iron ploughs have been substituted in many places. Ploughing is rarely resorted to in the regada. Sometimes the holdings are so very extensive and the cattle so rare that it will not facilitate ploughing throughout. Further there is no need perhaps inasmuch as the black cotton soil cracks in all directions very deep and soaking takes place to a considerable depth.

Principal crops and Exports. The stable crops of this District may be briefly stated as paddy, ragi, cholam, cumbu, korra, horsegram, bengal-gram and oil-seeds such as, gingely, castor and groundnut, and lastly cotton. Of these the food products are intended for home consumption, while the oil seeds, cotton and horse-gram are exported elsewhere every year.

Economic Condition of the Agriculturist. The District on the whole is the poorest and the most backward in the Presidency regarding agriculture and other occupations. The unfortunate ryots have to face very frequently serious droughts. From a study of the statistics it can be seen that the District has been subject to famines every five to ten years with the result that, before the ryot recovers from the effects of one, he is steeped into another. During the current year owing to failure of both the monsoons famine conditions have come to stay and the Government has already opened famine-works throughout the District. If the District is to be freed from such disasters, the only remedy lies in bringing into existence protected means of irrigation, and in educating the masses to adopt improved methods of agriculture on modern lines.

The Economic Geography of the Anantapur District

By

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The District of Anantapur is geographically a part of the Deccan and exhibits all the characteristic physical features of this famous plateau region. Lines and clusters of rocky hills, wide plains broken up by ridges, undulating wastes clothed with a miserable thin grass and dotted with small stunted trees, a few valleys of brighter vegetation, rivers forcing a passage through rocky uplands between steep and high banks and swollen with floods for short periods, but mostly running dry—these sum up the relief of the District.

The district is roughly an oblong in shape, the longer axis running north to south. In the south-west however, a part of one of the districts of Mysore juts so far into it that it nearly cuts off one of its taluks, Madakasira from the rest. But correspondingly in the south-east, the district bulges out.

The general slope is from the south to the north. The two southern taluks of the District, Madakasira and Hindupur are a part of the Mysore plateau and stand at a higher elevation than the rest of the District, the average height being 2000 feet above the sea level. They form a distinct natural region. The soil is red loam and in parts especially where water is available very fertile.

The Central taluks of the District, Penukonda, Kalyandrug Dharmavaram, Kadiri and Anantapur cover a vast expanse and consist chiefly of arid treeless plains. The average height above sea level is 1200 feet. The soil is wretched, made up as it is of red sand and gravel with a slight admixture of red loam and black soil in parts. Most of the land here is more often fallow than under the plough and the resultant diminution in cultivable area gives this region a woeful and poverty-stricken appearance.

The two taluks in the north, Gooty and Tadpatri contain large areas of plains. From the central region as we go north the land

dips into the valley of the Penner which here runs west to east to rise again to a height of 1100 feet in the Gooty taluk. Towards the north-east however, in the Tadpatri taluk, the land does not rise to such a height, but is only 900 feet above the sea.

Though the general slope of the district is from the south to the north, the central portion forms as it were a watershed. The western part drains into the Penner and the eastern into the Chitravathi. The only exception to this is portions of the western sides of the Gooty, Kalyandurg and Madakasira taluks which drain towards the Hagari. The lines of hills in the District run north and south.

The most important river of the District is the Penner. It rises in one of the hills of the Mysore State and enters the district in the extreme south of Hindupur and flows in an almost northerly direction for about 80 miles. Near Pennahobalam in Gooty taluk, it makes a sudden curve to the east and flows through the Gooty and Tadpatri taluks for about 50 miles. In this part of its course the river spreads itself out, its bed is wide and sandy and the banks are low like those of a Deltaic river region. It is in floods for short periods and thereafter runs dry except for a small trickle in the middle of its sandy bed.

The other river of importance is the Chitravathi. It also rises in one of the Mysore hills. Entering the district in the Hindupur taluk, it flows like the Penner due north between steep and high banks through picturesque hills for a length of about 40 miles, until at Bukkapatnam it emerges into a plain and flows into a reservoir, the biggest in the district, the surplus water of which is again dammed in the Dharmavaram taluk. Thereafter several streams join it, it becomes considerable in size, its course changes to the east and running through a narrow channel among the hills across part of the Tadpatri taluk it joins the Penner river in the Cuddapah district. Like the Penner, the Chitravathi is not a perennial river, quickly drying up after floods.

Besides these two important rivers, there are a number of pretty large streams which supply water to irrigation channels and tanks.

The climate of Anantapur is determined by its position in the interior and between 13.75° and 15.15° North. The hottest months are March, April and May when the temperature rises to 103° to 105°. But after the south-west monsoon, the heat goes down and for the rest of the year the climate is tolerable.

The situation of the district in the middle of the plateau region of the peninsula accounts for its being the driest part of the Presidency. Lying as it does in a zone between the two monsoons it is deprived of the benefit of both of them. The Western Ghats are so close that they cut off completely the south-west monsoon from Anantapur and the only evidence to us of the break of the monsoon on the west coast is the setting in of high winds that continue to blow for nearly three months from June onwards. And the district is so far away in the interior from the east coast that the north-east monsoon has already shed its moisture before reaching us. The average rainfall is thus hardly 23 inches in a year.

But the scantiness of the rainfall is not so serious a problem to the ryot as its uncertainty. The bulk of the rain falls in the three months of August, September and October. Of the three natural regions described above, the southern gets about 24 inches, the central 22 and the northern 23 inches roughly. The scarcity of rainfall and its uncertain distribution coupled with the barrenness of the soil in the major portions of the district explain why Anantapur has been periodically subject to droughts and has had many bad seasons, sometimes being on the very verge of famine.

The sources of water supply in the different parts of the district are necessarily adapted to its relief and the amount of rainfall. The southern taluks mostly consist of undulating uplands and afford natural advantages for the comparatively heavy rainfall of this region to be stored up in tanks. This is why Madakasira and Hindupur have a larger percentage of cultivated land under tanks than any other taluks.

River channels are another source of water supply for cultivation. But as the two chief rivers of the district are in flood only for a few days at a time, temporary sand dams are constructed to divert the water of the small streams in wet weather after the floods. Such channels are also dug in the bed of the river to take off the spring water. A more distinctive feature of the water supply of the district for irrigation is its spring channels. They are either dug from jungle streams or from land springs in tank beds and valleys. The former are often dug for miles in the beds of the vankas before reaching their *ayacut*, while the latter are marvels of industry being often excavated to a considerable depth for a mile or more.

About one third of the irrigated area in the district depends on wells. Except in the black cotton soil where the subsoil water lies at a great depth and beneath a stratum of hard limestone and

mostly too brackish to be of any use for irrigation, well irrigation is the most reliable source and the government have taken all possible steps to increase the area under it. The central region by the nature of its physical features depends most on this third source of water supply.

The nature of crops grown in the different parts of the district is determined by the physical features, climate and the sources of water supply of the three divisions.

Wet crops form only 8% of the total area cultivated. This is easily explained by the poverty of rainfall and the general inhospitality of the soil. Most of the wet crop area lies in the south under tanks and to a little extent in one or two taluks of the central region.

Among the wet food crops, paddy necessarily occupies a low place as it requires great quantities of water. Ragi on the other hand is very popular. It requires much less water than paddy. The ragi grower is not therefore weighed down by anxiety even when the tanks do not in any year receive a full supply. It is successfully grown both under tanks and wells. In the southern taluks, because of the large number of tanks and wells, ragi covers more than 20% of the total area covered. For the reasons mentioned above sugar-cane is a valuable crop grown in this same region. But on account of the exhausting nature of the crop, the area under it is small.

In the central region as is but natural wet cultivation is unimportant, and even in the favoured areas dry crops are generally grown, the only exception being the lands lying under the tanks of Anantapur and Dharmavaram.

Horsegram occupies a larger area than any other staple, for this is a crop which will thrive on the most wretched soil, with the most indifferent cultivation and the poorest rainfall, while Samai is the most important food crop. Other dry crops of this area are cholam, Bengal and Red gram.

The central area is also noted for the growing of certain oil seeds, castor, gingelly and recently groundnut. The last mentioned is increasing in popularity, though the natural conditions for its production are not quite satisfactory.

Coming to the north region, it is preeminently a cotton area. The black cotton soil is not only fertile but able to retain the moisture for a long time. Korra is grown as an early crop, but cotton is most important.

The Live-stock problem of the district is a serious one. The hardness of the soil and the low water level demand a strong breed of cattle for agricultural operations. But the difficulty of fodder stands in the way of such a breed being raised. Necessarily better cattle have to be imported. But the sheep of the district are a source of profit to the breeders. In the central region, especially in the west, not only is the climate eminently suitable for sheep-farming but the fugitive nature of the fodder supply makes sheep-farming the only alternative to uncertain cultivation. Hence sheep are reared in large numbers in this central region, for their manure and their skins. In the southern taluks there is a ready market for them, Bangalore importing quite a large number every week for mutton. Thirdly, and this is more important, the Kurubas of the central taluks, especially in Kalyandurg shear the sheep and make use of the wool for the manufacture of cumblies.

The nature of the industries carried on in this district and their location in particular areas can be easily deduced from the facts mentioned above.

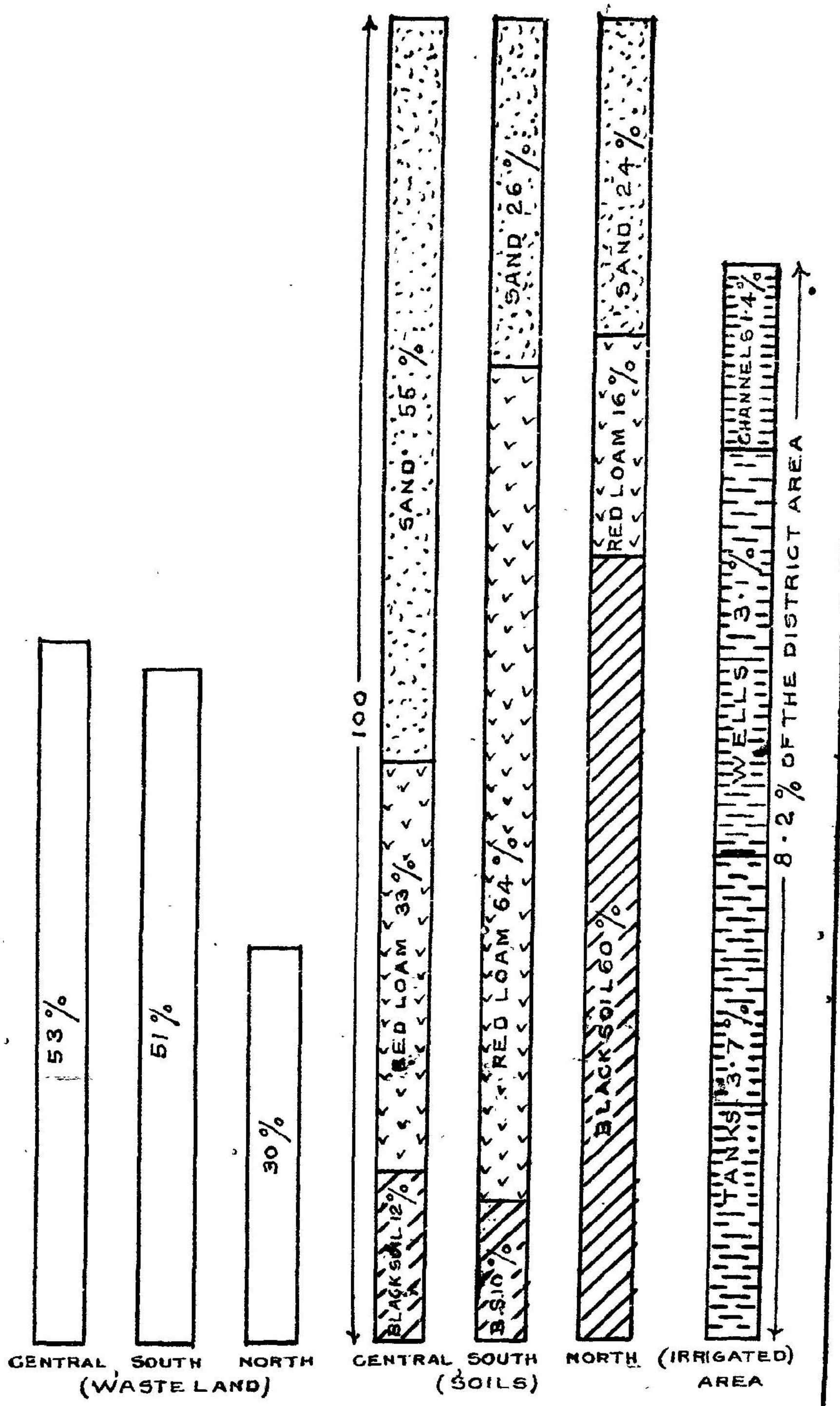
The great cotton belt of the north has given rise to an important industry, the ginning and pressing of cotton. Tadpatri alone boasts of more than a dozen ginning mills, each of which employs 50 or 80 persons, while the Pressing factory owned and managed by Messrs. Binny & Co. is a large affair, giving work to more than three hundred persons. Guntakal and Uravakonda are the other centres of ginning. It may be said that no raw cotton leaves the district now-a-days without being ginned and pressed.

Weaving of cloth is done here and there from imported yarn. Uravakonda, Tadpatri and Dharmavaram are noted for it. But the industry cannot attain to any importance as both the climate and the absence of power are against it. Dharmavaram is also a famous centre for silk cloths and sarees.

The manufacture of cumblies is another characteristic industry of this district. In almost all the villages of the Kalyandurg taluk and in parts of Gooty and Anantapur taluks cumblies are woven from the wool obtained from local shearing. But Belliguppa is most famous for this industry. The manufacturers mostly depend for their wool supply on other parts of the district and to some extent on parts of Bellary. A very brisk trade is carried on in this article. The reason for the localisation of the cumbly industry at Belliguppa seems to be that before the bifurcation of the district, the village was one of the centres of the cumbly industry of the Bellary district; and even after it was

FIG. 20.

PERCENTAGE OF WASTE LAND SOILS & IRRIGATED AREA.



separated from Bellary and attached to the Kalyandurg taluk of this district, it continued to attract the trade in raw wool, and the industry maintained its importance.

The manufacture of jaggery has of late become a minor industry of some importance. The Hindupur market is much sought after for this article and the Manchepalle Bellam of this area has acquired quite a reputation for its sugar content and its comparatively white colour. Groundnut shelling is coming more and more into importance.

On the whole it need hardly be emphasised that the industries of the district are far from attaining to any great importance. A higher percentage of the people than in other districts depend for their daily bread on agricultural and pastoral pursuits alone.

Considering the nature of the ground, we may say that the district has adequate means of communication. It is fairly well supplied with roads and railways. But most of the rivers and big vankas are not bridged. Railway lines pass through all the taluks of the district except Kalyandurg and Madakasira. When these are linked to other parts by means of feeder lines, there will be no reason to complain of inadequacy of means of communication with regard to the trade of these remote areas.

We may easily infer the economic condition of the people of this district from the foregoing short survey of its crop production and distribution, its industries and manufactures. The density of its population (156 per sq. mile) is only half the average figure for the Presidency as a whole. Very few of the ryots are large land holders. The very large majority are small farmer-cultivators. The natural conditions are inimical to agricultural prosperity. "The soil is infertile, the rainfall slight and uncertain, fuel and fodder are scarce, irrigation facilities are few, the indigenous cattle are bad, manure is difficult to get and the people are few in number. Famines and scarcities have been rather frequent and people have suffered much from them. On the whole the district is without doubt the poorest and most backward of all districts whether as regards agriculture or other industries."

But I need not have fortunately to bring my paper to a close on this note of despair. For if report speaks true, two of the mining industries of the district which had for sometime past decayed have a prospect of revival.

Vajra Karur, a village on the road from Guntakal to Uravakonda was once famous for its diamonds. It is said that one of the

Vizianagar Emperors had a regular agent at the place to buy up the stones discovered. Even to-day after heavy rains, people swarm to the place to try their luck and roam about in search of diamonds washed on to the surface. Only 5 years ago a diamond found by a villager fetched 5000 rupees in the Madras market. No wonder that sowcars from Hubli and Bombay come periodically to the village to strike bargains. I am told that two mining licenses have been granted recently.

But the more important mining industry, is the gold industry of Ramagiri, a village in the Dharmavaram taluk. For nearly two decades till 1925, the North Anantapur Gold Mines Company Ltd. was working this gold mine evidently at a profit. But perhaps owing to the drop in the price of gold, the concern had to be wound up. The present phenomenally high price of the yellow metal has induced a firm to take out a license for restarting the mining work in the hills near Ramagiri village.

So then, gentlemen, if this industry at least succeeds, Anantapur may become a rival to the Kolar region of the Mysore State, and when the next Geographical Conference meets in this town, the gentleman who will be reading a paper on the Economic Geography of this district will have the pleasure to dilate on the greatness of the industry and the consequent increase in prosperity. May this poor district have such a happy consumation in the near future!

Urban Geography of Anantapur District

BY

MR. R. DANN,

Director of Town-Planning, Madras.

Owing to the climate and the resultant nature of the terrain the prospect of urbanisation on any large scale in Anantapur is somewhat remote. The rainfall of the district is uncertain and averages only 23 inches annually, and much of the soil is rocky and infertile ; and there has been no large scale irrigation, but parts of the district stand to benefit by the Tungabadra project if and when it is carried out. The District is comparatively healthy according to the vital statistics; but the population is emigrant in character owing to lack of opportunity within the District itself. Such conditions are not conducive to rapid growth as there is no *raison d'etre* for rapid expansion. The population of the whole district is 10,50,411 and the area 6740 sq. miles giving an average of only 155 per sq. mile as against the presidency average of 328.

It is not an easy matter to write a paper on the Urban Geography of Anantapur Town or the Towns of the District, for it is the least urbanised District in the Prsidency and there is very little of note in the way of urban development in any of the towns. Anantapur town itself though a District headquarters has a population which is less than many villages. The Municipalities of Anantapur, Hindupur and Tadpatri are 74th, 77th and 78th in order in the 83 Municipalities in the Presidency. The biggest agglomeration of population in the district is however not Anantapur town but the villages of Timmancherla and Guntakal which go to make up Guntakal town with a population of 15,620. The curious fact about Guntakal is that the Railway Junction of that name is in Timmencherla and two miles away from Guntakal proper. Whereas Guntakal is near to Timmancherla station! Although the towns of the district are so small, they have shown large increases during the last half a century, Guntakal having increased from 3099 to 15,620, Anantapur from 4,907 to 15,099, Hindupur from 6,694 to 14,211 and Tadpatri from 8,585 to 12,600. The panchayats of Uravakonda, Gooty, Kadiri and Dharmavaram have also shown varying but fairly large increases. The total population in these 8 towns is 78,019 as compared with 55,881 50 years ago, an increase

of nearly 40%. Even so the 8 towns together have much less than such towns as Coimbatore, Salem or Calicut and less than half the population of Madura and much less than George Town. Under the circumstances there is not much that can be discussed under the heading of Urban Geography of the District. The urban population is 110 per thousand of population in the district.

Anantapur Town gives the impression of a larger town owing to its possessing all the buildings associated with a District Headquarters together with the modern buildings of the Ceded Districts College, the Police Recruit school etc. It is in two distinct parts, the congested old town under the bund of the great tank constructed in 1364 by Chikka Udayar, a minister of the early Vijayanagar Kings and surrounded by wet lands and the nearer area including Government offices on the higher dry lands nearer the station with the modern George Town extension area, on the west side of the station. No development schemes have however been carried out under the Town Planning Act, the George Town extension having been carried out previous to the introduction of that Act with assistance from Government and by the help of Co-operative Building Societies. Anantapur has a protected water supply system but no satisfactory drainage.

Next to Anantapur in importance is *Hindupur* with a population of 14,210, a recent municipality of progressive tendencies, for although so small it was one of the earliest municipalities to carry out an electricity scheme. On the other hand it has no protected water supply system. It is situated in the Guntakal Bangalore metre gauge section of the M. & S. M. Ry. but geographically somewhat off the beaten track, for it is not on a Trunk road; but it is about the largest commercial centre in the district having a number of cotton ginning and groundnut decorticating mills.

Towards the Northern end of the district is the third municipality, *Tadpatri*, with a population of 12,600. Tadpatri is also a commercial centre chiefly interested in cotton and groundnuts and a large moving population. It has two temples of interest; Mr. Fergusson particularly commends the Gopurams of the temple that is now disused.

Guntakal in the North has already been mentioned as it has the largest population of any town in the district, a position which it owes to the fact that it is one of the most important Railway Junctions in South India being on the Madras-Bombay main line and having metre gauge connections in addition with Marmagoa,

Bangalore, Hyderabad and Bezwada. It is the metre gauge district headquarters, whilst only a few miles away *Gooty* (population 9,712) owes its development to the fact that it is the broad gauge district headquarters. Guntakal adds cotton ginning to its railway activities but Gooty is without any serious commercial or industrial interests. Gooty, moreover, is a taluk headquarters and was at one time a municipality. It has a fine hill fort in excellent preservation.

Dharmavaram is another town which has grown considerably due, no doubt, to some extent to the fact that it is a Railway Junction. It is an important weaving centre.

Of towns with a past *Penukonda* should be mentioned. It is a Taluk headquarters, a small town with a diminishing population of about 5000, but it has one of the most picturesque hill forts in South India of great historical interest as the refuge of the Vijayanagar dynasty after their defeat by the Mussalmans. It has a palace and Temples of great architectural interest.

Population of Anantapur District

By

Mr. K. Srinivasaraghavan, M.A.,

The District of Anantapur lies east of the Mysore state, and is bounded by the Bellary, Kurnool, Cuddappa and Chittoor districts on the other sides. It is one of the four Ceded Districts. The whole area of the Ceded Districts in general is very poorly peopled, except along the narrow valleys of the Penner and its tributaries. The area has a low rainfall and has been historically the cockpit of the powers to the North and South. In the earliest times the Cholas and Hosalyas on the South contended with the Chalukyas on the North. In modern times this area has been the middle region between the Maharattas, the Nizam, the English and Mysore (under Haidar and Tippu). Except perhaps during the days of the greatness of Vijayanagar, these districts have never had independence and were never well developed under an established rule.

In addition to this, the relief has played an important part. Covered over by low hills, with an infertile soil and low rainfall, it has never been coveted by man. It lacks natural mineral wealth, and there is no easy irrigation system possible. It has not had any developments in the near past to create urban centres. Thus lacking in agricultural and industrial resources and having no artificial nodalities, and historically being the battle ground of powers, and never having possessed peace and prosperity, it has not developed in human settlements, and hence the low population.

Anantapur is typical of the whole region. It is covered by hills, possesses an infertile soil and has an annual rainfall of less than 25″. It can roughly be divided into parallel strips running N to S., along the Penner and Chitravathi valleys, with a wide strip of lowlands in the N. E. of the district. Of the nine taluks into which it is divided for administrative purposes, the middle region comprising the taluks of Kalyandurg, Anantapur and Dharmavaram is the least densely peopled. The important towns lie either in the river valleys or along the railway lines. The towns on the railway lines have shown a greater improvement in the last decade than the other towns. Of these Guntakkal, the first town of the district, has been rapidly developing due to the railway colony and the consequent development of the area as an industrial centre of some sort. Anantapur, the second town in

population, is still of importance being the district headquarters and has a first grade college—the only college of the Ceded Districts. Hindupur, is the next biggest town owing its importance to the merchant community of the place and its nearness to the Mysore state and its position on the highway between Mysore and the Ceded Districts.

Distribution of population. Lying far interior from the rich lands of the East and west coasts and situated in the rain shadow of the Western Ghats it has almost the lowest density of all the 26 districts in the Madras Presidency. Its density per sq. mile is 156 while the Presidency average is 328. It is the 25th in the rank of densities, the last (26th) being Kurnool with 135. In extent it is the 7th (6741 sq. miles) in the Presidency and in strength of population it is the 21st (1050411). The distribution of urban rural population is 1:8; 117421 out of 932990 live in towns. This is too high a proportion for any district in India and indicates that people are deserting the villages and are gathering in towns. There is a flood of emigration also going on, which on the whole weakens the population of the District. The variation of the density in the 9 taluks, still better indicates the geographical control on human activities. Hindupur taluk has the highest density of 256 followed by Madakasira 218. The least dense is Kalyandrug with 167. There are very few taluks in the Presidency with so low a density as that of Kalyandurg.

STATEMENT I.

Variation in population. From the year 1891-1931 the population has had the following variation in every 10 years. + 71117, + 29466, — 7306, + 9449, and the percentage for 1911-21 is — ·8 and for 1921-31 is + 9·9. The population has been steadily decreasing in variation till 1921 and then there has been a slight increase during the last decade. The decrease in the otherwise steadily increasing Indian population denotes an emigration that has been detrimental to the agricultural possibilities of this area.

Among the taluks Kadiri and Gooty have had the greatest increase. Guntakal and Gooty have been growing in importance as railway and industrial centres. Kadiri has enjoyed a spell of a happy decade and is growing into a small industrial centre. But Madakasira has been densely peopled by a rural population and is still increasing in strength. The factors that have caused the growth of Hindupur have partly improved this taluk. The recent improvements in Mysore have had their repercussions in this taluk which lies like a peninsula into the Mysore state surrounded on all sides except the East.

But the greatest variation is to be observed in the population of towns. Except two or three the other towns are still very low in population. There are 12 important ones. The biggest of these is Guntakal with 15620, followed by Anantapur with 15099. The towns of this district are much less peopled than some of the villages in the deltas of Kaveri, Godaveri or Krishna or the narrow strip on the west coast about Calicut.

STATEMENT II.

Languages of the district. The language of the district is mainly Telugu. But Canarese is also spoken by the merchant class, who have dealings with Mysore on the one side and Bellary on the other. The Tamil population is restricted almost to the Brahmin Community. The following table gives the relation of languages among the Brahmins:

Telugu	..	10062
Kanarese	..	6902
Tamil	..	1295
Brahmins	..	18259

Hindustani is spoken by a considerable number especially in the Kadiri and Gooty taluks where the Mahomedan population is greater. There are a few Christians in Gooty and Guntakkal. The history of Christian missionary activities in this district has seen various phases, and though brought in very early, it has not had very much of a success.

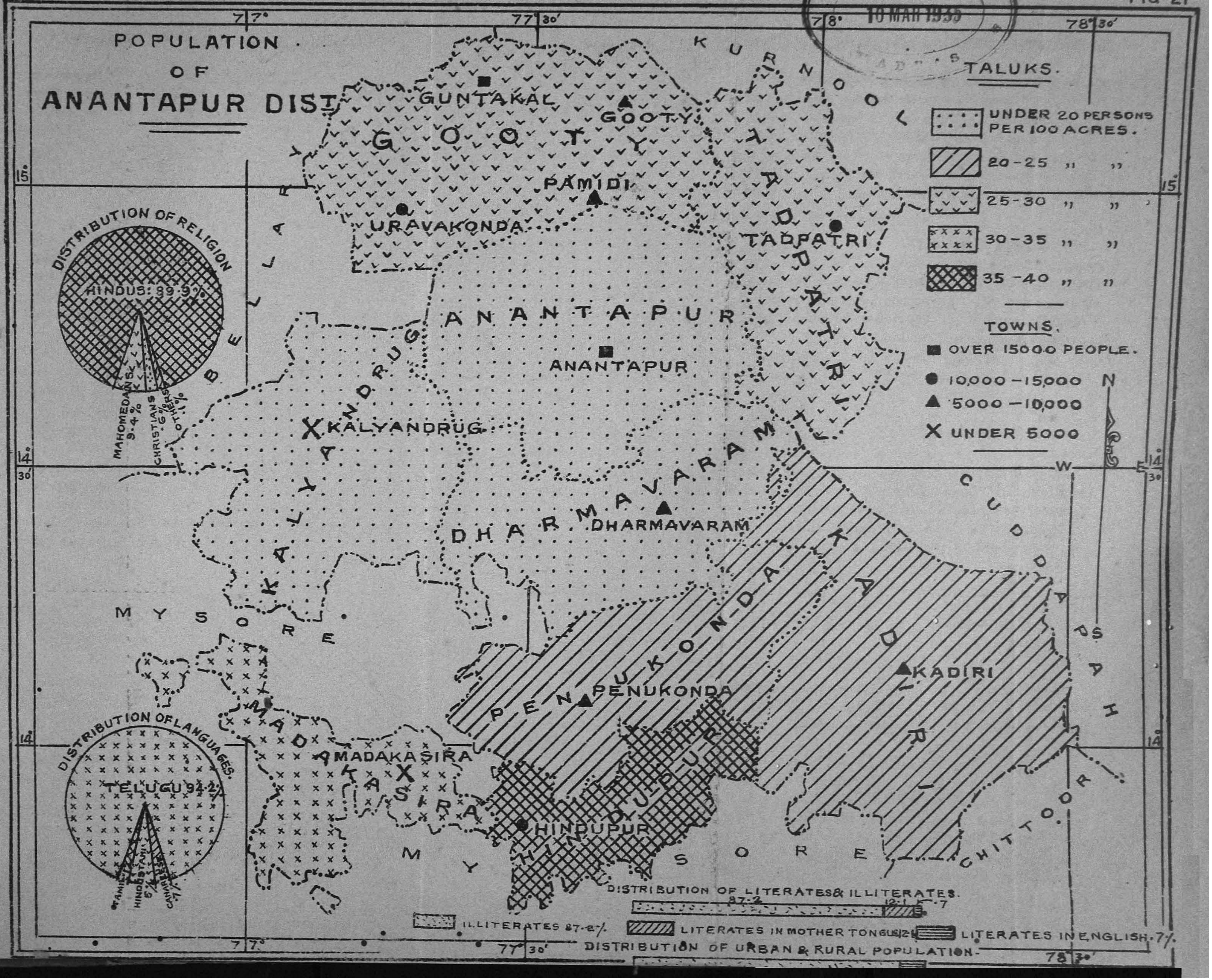
Telugu is spoken by	..	94.2%
Canarese	..	.7%
Hindustani	about	.5%
Tamil	..	.1%

STATEMENT III.

Literacy and Education. The number of people who can read and write in their mother tongue is as low as 12.1 per hundred of the total population. The percentage of literates in English is only ·7.

In general the education in this district is very poor. The percentage of literates is abnormally low. The percentage of school going population is 5·4 which indicates that the literate percentage will not increase even in the next 10 or 15 years. But for all the Ceded Districts, it is this district that possesses a Govt. College for higher studies with a strength of 301 boys. There are 10 secondary schools (1 of which is for girls) with 2255 pupils.

FIG 21



POPULATION OF ANANTAPUR DIST
TALUKS.
UNDER 20 PERSONS PER 100 ACRES.
20-25 " "
25-30 " "
30-35 " "
35-40 " "
TOWNS.
OVER 15000 PEOPLE.
10,000-15,000
5000-10,000
UNDER 5000
N
W
E
DISTRIBUTION OF RELIGION
HINDUS: 89.9%
MAHOMEDANS 9.4%
CHRISTIANS .6%
OTHERS .1%
DISTRIBUTION OF LANGUAGES.
TELUGU 94.2
TAMIL
HINDUSTANI 5%
CANARESE
GOOTY
GUNTAKAL
GOOTY
PAMIDI
URAVAKONDA
TADPATRI
TADPATRI
ANANTAPUR
ANANTAPUR
KALYANDRUG
KALYANDRUG
DHARMAVARAM
DHARMAVARAM
PENUKONDA
PENUKONDA
KADIRI
KADIRI
MADAKASIRA
MADAKASIRA
HINDUPUR
HINDUPUR
KURNOOL
BELLARY
MYSORE
MYSORE
CUDDAPAH
CHITTOOR
77°
77° 30'
78°
78° 30'
15°
14° 30'
14°
DISTRIBUTION OF LITERATES & ILLITERATES.
87.2
12.1
.7
ILLITERATES 87.2%
LITERATES IN MOTHER TONGUE 12%
LITERATES IN ENGLISH .7%
DISTRIBUTION OF URBAN & RURAL POPULATION.

There are 3 training schools for Masters and one for Mistresses with a total strength of 271 pupil teachers.

STATEMENT IV.

Religion. The population is mainly Hindu with a sprinkling of Mahomedans and Christians. The only considerable percentage of Mahomedans is found in the two taluks of Gooty and Kadiri and the Christians are almost limited to the Gooty taluk.

Occupations and Industries. The major portion of the population live by agriculture, and very few are employed in any industrial concern. There are a few groundnut mills and ginning mills at Hindupur, Guntakkal and Gooty. There are a few local industries, *e.g.,* Hides and skins at Gooty which is suffering for want of protection. Hindupur and the surrounding areas have a few hand looms. Dharmavaram is a weaving centre. The towns were once specialising in the export of groundnuts, cotton and tamarind. But the depression in trade has affected both the industry and agriculture.

Health and Hospitals. This district is one of the healthiest and has a very low death rate. Death rate per 1000—is distributed as follows. Fever 5.6, dysentery 2.4, cholera 1.4. Plague rarely visits the district and has only once attacked Anantapur causing a mortality of 7·2 per 1000.

Drink and crime. For the small population the number of liquor shops is far too much ; and for cases of murder and assault the district is one of the worst in the Presidency.

	No. of shops.	Visitors.
Toddy	550	1728
Country spirits	219	4365
Ganja	18	53107
Opium	11	86902

Crimes (1930) Murder	.. 30
Culpable Homicide	.. 5
Assaults	.. 47
Cattle theft	.. 40

There are 226 known depredators, with a police force of 689 and 12 sub-jails.

This shows that immediate attention has to be paid to the growing population of Anantapur (i) to prevent their emigration to other districts or to towns (ii) to give the necessary help to improve the existing poor state of agriculture and (iii) to engaging the labour of the available idle men who otherwise take to drink and murder.

STATEMENT I.

Population of Taluks.

No.	Name of Taluk.	Area in sq. miles.	Towns.	Villages.	Occupied Houses.	No. of Males.	No. of Females.	Total Population in 1931.	Density per sq. mile.	Increase % from 1911-21.	Increase % from 1921-31.
1.	Anantapur ..	926	1	114	23688	61049	55909	116958	126	5.4	4.6
2.	Kalyandrug ..	821	1	74	17590	45236	42211	87447	107	—3.9	9.1
3.	Dharmavaram ..	736	1	63	18888	46496	43528	90024	122	—1.3	1.5
4.	Kadiri ..	1162	1	141	35867	89600	83654	173254	149	2.0	15.2
5.	Gooty ..	896	4	132	31569	81476	78164	159640	178	—9.3	18.8
6.	Tadpatri ..	641	1	97	117315	59373	57942	117315	183	—2.4	5.2
7.	Hindupur ..	431	1	77	23507	56785	53409	110194	256	3.9	9.7
8.	Madakasira* ..	446	1	57	19160	49273	47808	97081	218	4.2	13.4
9.	Penukonda ..	682	1	98	23399	50246	48252	98498	144	—1.0	6.0
	Total ..	6741	12	853	215487	539534	510877	1050411	156	— .8	9.9

STATEMENT II.

Population of Towns.

Rank.	Town.	Population in 1931.	Population in 1921.	Increase % from 1911-21.	Increase % from 1921-31.
	Total for district ..	1050411	955917	— .8	9.9
2	Anantapur ..	15099	11452	35.4	31.8
8	Dharmavaram ..	9346	8117	9.9	15.1
6	Gooty ..	9712	8720	— 9.1	11.4
1	Guntakal ..	15620	12519	26.6	24.8
10	Pamidi ..	5147	5230	—32.4	— 1.6
5	Uravakonda ..	12079	10274	— 6.8	17.6
3	Hindupur ..	14211	12456	12.9	14.1
7	Kadiri ..	9352	11619	11.03	—19.5
12	Kalyandrug ..	4419	4596	—30.98	— 3.2
11	Madakasira ..	4524	3641	—31.3	24.3
9	Penukonda ..	5262	7385	9.8	—28.7
4	Tadpatri ..	12620	11293	—10.3	11.8

STATEMENT III-(a).

Literates per Taluk.

No.	Taluk.	Total Literates in M. Tongue. Males.	Females.	Literates per 1000. Males.	Females.	Literates in English. Males.	Females.
1.	Anantapur ..	7566	1080	124	19	1757	167
2.	Kalyandrug ..	4730	313	105	7	264	7
3.	Dharmavaram ..	4343	320	93	7	430	20
4.	Kadiri ..	8557	665	96	8	400	21
5.	Gooty ..	10927	1191	134	15	1889	237
6.	Tadpatri ..	6546	479	110	8	502	17
7.	Hindupur ..	6593	719	116	13	791	63
8.	Madakasira ..	5388	382	109	8	358	6
9.	Penukonda ..	4874	475	97	10	477	29
	Total ..	59524	5624	110	11	6868	567

STATEMENT III-(b).

Literates by Religious Communities.

	Total Literates in M. Tongue.		Literates per 1000.		Literates in English.	
	Males.	Females.	Males.	Females.	Males.	Females.
Hindus ..	49916	4516	103	10	5533	266
Mahomedans ..	8108	476	161	10	735	23
Christians ..	1213	611	354	196	576	275
Others ..	287	21	462	40	24	3
Total ..	59524	5624	110	11	6868	567

STATEMENT IV.

Population of Religions.

No.	Taluk.	Hindus.	Mahomedans.	Christians.	Others.
1.	Anantapur ..	106648	9587	676	47
2.	Kalyandrug ..	83850	3503	83	11
3.	Dharmavaram ..	84895	4762	349	18
4.	Kadiri ..	150259	22334	655	6
5.	Gooty ..	136826	20450	2293	71
6.	Tadpatri ..	100584	14761	1908	62
7.	Hindupur ..	93345	114700	309	70
8.	Madakasira ..	92698	3489	46	848
9.	Penukonda ..	89663	8598	227	10
	Total ..	943768	98954	6546	1143
	% of the Total for the District ..	89.9	9.4	.6	.1
	Grand Total for the District ..	1050411			

The Geography of Gooty Town

By

Mr. V. Koprasachar, B.A., B.Ed.,
London Mission High School, Gooty.

1. Gooty town (Lat. 15° 6′ 53″ N. long. 77° 4′ 32″ E.) in Anantapur district is 32 miles away from Anantapur to the North-east. Situated on the main railway line from Madras to Bombay, it is 258 miles from the former. It is the headquarters of the Northern division of the district, though there are at least 3 towns in the division itself which are far more important in trade and population.[1] The town proper covers an area of more than 9 square miles; and the union panchayat area covers much more.[2] Its height above sea level is 1200 ft .

2. Gooty town is a fairly flourishing place, but it is neither a commercial nor trading centre, and is chiefly held together by the offices and institutions which exist within it. Its chief claim for fame rests on its fortress and the part it played in the shaping of South Indian History.

3. Though there is no continuous history of Gooty available, it is clear from the many records and inscriptions found in various parts of southern India that Gooty was a famous place from at least the 10th century A.D. The fort of Gooty was considered to be the key position for the central area, and the various dynasties of rulers who came into prominence in quick succession in the middle ages, conquered Gooty from their predecessors and caused it to be recorded in inscriptions. Such inscriptions of the 12th and 13th centuries are found at Kalyan in the Nizam's dominions, at Harihar in the Mysore territory and at Daulatabad. Later when the Hindu Kings of Vijayanagar ruled over most of Southern India, Gooty is said to have been the seat of one of the principal Governors of the Kingdom, and a large part of the fort was constructed in those days. After the fall of Vizianagar it fell

1. Population of the towns in 1931 were: Gooty 9690, Tadpatri 12620, Guntakal 15620, Uravakonda 12079.

2. The union panchayat area cannot be given accurately since it has not yet been surveyed.

into the hands of the Muhammadans and subsequently into the hands of the Marathas, of whom Morari Rao was the last great ruler who made Gooty his centre of activities. In 1775 Hyder Ali conquered the fort and sent Morari Rao into imprisonment.

Gooty formed part of the territory ceded to the company by the Nizam in 1800, and the place was garrisoned by 3 companies of native infantry under the command of two British officers. They were finally withdrawn about 1860 after the present police force had been organised.

4. It is not without reason that Gooty was held to be the Key position of the central area in the olden days. The two main reasons for the importance of the town in the olden days were (i) the usefulness of the towering rock and (ii) the natural advantage for constructing a first class fort.

(i) Gooty rock rises to a height of 2171 ft. above sea level and nearly 1000 ft. above the level of the surrounding country. It is almost the highest point in the highest part of the taluk except the Nagasamudram hill. The rock commands all the fortifications and the town in the centre, and in spite of the undulations of the surrounding country, one can easily see with the naked eye a distance of more than 20 miles from the top. It is said that from the top of the rock, messages were sent with the aid of light flashes, to Adoni and Bellary, both of which are 50 miles away. Considering the lack of means for quick communications in those days, the importance of the rock as an observation centre cannot be easily exaggerated. It served as an excellent watch tower in days of the Maratha raids.

(ii) In the middle ages of unstable governments, security from raiders was the principal factor in selecting the site of the seat of a chieftain, and Gooty afforded an ideal site for the construction of a first class fortress. Wilks describes the fort as follows: —

" The fort is composed of a number of strong works, occupying the summits of a circular cluster of rocky hills, connected with each other, and enclosing a level space which forms the site of the town. The town is approached from the plain by a single fortified gateway on the South-west, and by two small foot-paths across the lower hills, communicating through small sally-ports. An immense smooth rock, rising from the northern limit of the circle, and fortified by gradations surmounted by 14 gateways overlooks and commands the whole of the other works and forms

a citadel which famine or treachery alone can reduce. About half-way down the side of the great rock is a projecting shoulder of considerable extent on which are barracks for the regular troops, now fast falling into decay.

5. With the improvement of military equipment and methods of warfare, the importance of Gooty as a place of security and protection became less and less, and by the middle of the 19th century the British abandoned the town as a military station, and it was saved from going into oblivion by two other factors.

(i) Before 1852, there were no good roads worth the name in the whole of the district. The construction of roads received a great impetus during the famines of 1866 and 1876, and now two of the three best metalled roads in the district pass through Gooty. One of them is the Secunderabad Bangalore Road, which runs from Kurnool through Gooty, Anantapur and Penukonda into Mysore territory. The other is the Cuddapah-Bellary Road which runs across the whole of the northern portion of the district, from Bellary through Gooty and Tadpatri on into Cuddappah. There is also a branch road from Gooty to Adoni through Pattikonda. Thus Gooty became an important nodal town of the district.

(ii) Gooty was connected to Madras by the Railway in 1869 and was almost the first important place of the central districts to be placed on the Railway map. With the improvement of railways Gooty was made the headquarters of a Railway District, and it became the seat of District Traffic,[3] Loco and Engineering offices and a considerable settlement has sprung up round this railway station and is often distinguished from Gooty proper under the name of Gooty R. S.

6. Gautamapuri was the ancient name of the place and the present Gooty is a corrupted form of Gautamapuri. Local tradition says that its name is derived from the fact that the Rishi Gautama lived upon one of the rocks. A small cave in a hill to the north of the railway line about ½ a mile from the railway station on the way to Madras, is pointed out as the place of residence of the sage Gautama and is locally known as the Gautamasrama. A devoted railway servant has beautified the place by the construc-

3. The District Traffic Superintendent's office has since been removed and amalgamated with the one at Royapuram.

tion of a small temple near the cave, and a well and a small building for the use of the visitors. Railway passengers travelling by train to Madras can easily recognise the place by the flickering lights in the temple, or the red and white paintings on the rocks to their left. Mr. Francis has recorded an interesting suggestion made to him that the Telugu *guththa* (a cluster or bunch) might have been the original of the name since this word is descriptive of the group of hills on which the fort stands.

7. Gooty town as it is may be divided into 3 parts, popularly known as the Kota, Peta, and Gooty railway station. The first two divisions making up the town proper are at a distance of about two miles from the latter, which itself is situated round the Gooty Railway Station. As the names indicate *Kota* is the area enclosed within the fort and surrounded on all sides by the bare rocks. *Peta* is the trade and business centre.

There is only one main street in the town, beginning from the foot of the highest rock passing through all the town and leading to Gooty Railway Station. Except for a branch road from the fort gate leading to the High School and the tank, all the town is constructed within about a hundred yards of this main street.

Kota is roughly triangular in shape with its base to the east and its apex coinciding with the fort gate on the west. Being enclosed on sides by the rocky hills, the town here is very narrow and congested. There is little or no open space and the houses are all close to one another.

Emerging out of the fort gate we come away from the rocks, and the town spreads here on both sides of the main road, and the branch road. At the end of the branch road on the South-Western side are the high school and the London Mission Colony; will its spacious bungalows and large compounds. Further west is the large tank said to have been constructed in 1619 by Rama Raya one of the expatriated princes of the Vijianagar dynasty.

At the western end of the main street, about a mile from the rock is the Munro Choultry. Here the Street meets the Kurnool—Bangalore Road and the Gooty—Pattikonda Road. A few yards from the choultry, on the western side of the Kurnool road and to the N. E. of the Pattikonda Road are the several public offices and the Munro Hospital.

To the north of the offices a new colony of lawyers and officials is fast growing. Tired of the congestion and the unbearable heat of summer, some of the well-to-do lawyers and officials are finding

it more convenient to build *roomy and well-ventilated houses* here.

8. The recorded population of the town was as follows:—

1871.	6730.	1911.	9587.
1881.	5373.	1921.	8720.
1891.	6605.	1931.	9690.
1901.	9682.		

Within the last 30 years there has been practically no difference in the total population of the town. The marked fall of 9·1 % in 1921 was due to the influenza epidemic of 1918 and the disease was particularly fatal to persons in the prime of life, which naturally affected the birth rate in the succeeding years.

The Brahmins form 6·7 % of the population, and most of them live in the *Kota*. Being an intellectual class all of them follow the learned professions and lead a well-to-do life.

The Harijans make up 15·3% of the total population and most of them live in quarters set apart for them at the foot of the hill in *peta* to the south of the branch road leading to the tank. Being the poorest class, they all live in small hovels and low-roofed houses. They are all agricultural labourers depending for their daily morsel of food and drink on the daily wages they earn and consequently they are the first and worst to be affected by a bad season.

The Muhammadans form 30% of the population. Since they observe the *purdah* they live in exclusive quarters at the two ends of the town i.e., the eastern end of the *Kota* and the western end of the *Peta*. Some of the richest as well as the poorest of the people are among the Muhammadans, and they follow all walks of life.

The Christians are equal in number to the Brahmins, and like them, they are well educated. All of them live in or near the mission colony and most of them are dependent on the mission institutions.

The other Hindus including the Vysias form the majority of the population and they live mostly in *Peta* and the outlying areas in the *Kota*. Many of them are agriculturists and live by toiling in the fields. There is a large number of Vysias, and all of them live near their shops in the main bazaar in *peta*.

Nearly every one of those living in Gooty Railway Station is dependent directly or indirectly on the Railway. People belong-

ing to all castes and creeds live here, and the Anglo-Indians form a fair proportion.

9. The climate of Gooty is very hot in summer, really cool in winter and dry throughout the year. Though there has been no systematic record of temperatures, it can be confidently said that the average maximum temperature during the hottest months of March, April, and May remains between 100° and 105°. Being surrounded on all sides by the bare granite rocks, the reflected heat and glare of the afternoon sun is unbearable in this season. If there are good showers in June the temperature drops down by about 10° and continues to go down till December our coolest month. Winter is really cool and the mercury often goes below 60°

The Rainfall of Gooty is poor indeed, and at times (as in this year) it is very disappointing. Below are given the rainfall figures and the actuals for 1934.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Average	0.14	0.16	0.09	0.51	1.80	2.05	2.19	2.54	6.00	3.95	1.84	0.20	21.47
1934	—	0.27	—	1.05	1.45	1.93	3.68	0.91	0.40	1.68	0.89	0.06	12.30

The early showers of April and May enable the agriculturists to prepare the soil, and the sowing is done in June or July after the good rains. September is our rainiest month and the agriculturist looks to this for thorough soaking of the soil for the grown-up crops to put on corn. From the figures given for 1934 it is clear that the September rains disappointed all fond hopes of the eager agriculturist.

The average figures are very misleading and the actual figures of total rainfall vary from less than 9 inches as in 1923 to more than 36 inches as in 1916.

The water supply of the town is dependent on the several wells, and they in turn are dependent on an abundance of rainfall on the hills. As the amount of rainfall is very uncertain, water scarcity in the town is very frequent and in 1924 after the very poor rainfall of 1923, there was not a drop of water in the whole town for a few days. No wonder that it is recorded of the capture of the fort by Haidar Ali that "Morari Rao could no longer restrain his men from exclaiming even from the parapets, to the besiegers that they were dying of thirst, and begged to capitulate." Such of those who lived in Gooty in 1924, and are living now awaiting

the threatened water scarcity in summer can easily appreciate the above quotation.

10. There is little or no natural vegetation worth the name. The hills and the waste lands stand bare except for a bush of cactus here and there.

About 60% of the people live by cultivating the soil and growing grain and groundnut. The soil in and around Gooty is very poor red soil, and the poverty of the land can be judged from the fact that as much as 69% of the extent of the land in the revenue town of Gooty is left waste.

The long but shallow tank to the west of the town is intended to provide water for growing rice in an area of 960 acres. But on account of a series of bad rainfall years, the tank was never full within these 15 years, and consequently the extent of land growing rice has been considerably smaller.

In 1933, 1725 acres of land round Gooty was devoted to the growing of dry crops. 1037 acres or 60% of the cultivated land was used for growing the food crops, jonna, korra and sadda. The only crop that flourishes well in the red soil and provides the poor ryots with a little money for their clothing and other necessities is groundnut, and so a good proportion of the land is used for producing groundnut. In recent years however there has been a gradual reduction on account of the great fall in the price of the seed. Last year only 11% of the area was used for groundnut.

Among the other crops that are grown pulses form a large proportion.

11. As has already been noted, Gooty is no big trading place and no exact figures are available. The one important export from Gooty is groundnut. Since the roads from all directions converge on Gooty, and there is a big railway station, all the groundnut grown in and around Gooty is brought here for export. Near the railway station there are four groundnut decorticating factories, and several goundnut trading companies have opened branches in Gooty Railway Station.

12. There is but one industry worth mentioning in Gooty. Near the railway station, by the side of one of the feeder streams of the Gooty tank is an old established tannery, giving employment to about 60 workers and preparing everyday about 600 skins for export. On account of the slump in the hides and skins trade due

to the import restrictions in Germany and the increasing use of rubber and synthetic rubber in place of leather, and the consequent diminution in the demand for leather, the production in Gooty tannery has considerably fallen down within these 2 or 3 years. Formerly the tannery produced a 1000 pieces a day and provided employment to more than a 100 workers.

13. The most interesting site in Gooty is the famous hill fortress which has already been described. "It contains no buildings or remains of great architectural interest. On the top are two erections which were apparently a gymnasium and a powder magazine respectively, and on the edge of a cliff 300 ft. high is a small pavilion of polished chunam which is called Morari Rao's seat and commands an excellent view of the town below. There are many other buildings in ruins, and some of these were used by Munro as prisons for refractory poligars. The fort and the buildings on it are on the list of constructions specially conserved by Government.

For the religious needs of the people there are many temples and two of them were built in the days of Vijianagar's glory. One of them is at the foot of the big rock and the other is halfway up the hill in the north. There are several mosques in all parts of the town, and for the Christians there are two churches, one in Gooty town for the Protestants and another in Gooty Railway Station for the Roman Catholics.

At the foot of the great rock is the European cemetery. Here rested for a short time the body of Sir Thomas Munro, who died at Pattikonda in 1827, when on a farewell tour as Governor of the Presidency, through his beloved Ceded Districts of which he was the first Principal Collector. His remains now lie in the St. Mary's Church in the fort at Madras, but a cenotaph stands at the Gooty cemetery.

At the western end of the principal street is the Munro Choultry constructed to his memory, and in it hangs an engraving of Archer Shee's full length portrait of Munro now in the banquetting hall at Madras.

Only seven miles from Gooty, near Erragudi on the Gooty-Pattikonda Road are the newly discovered inscriptions of Asokan Edicts.

Geography of Hindupur

By

Mr. K. Nanjundappa, B.A.

Location.—Hindupur is situated in 13°49′ N. and 77°29′ E., close to the Penner River. It is a taluk head-quarters in the southern part of Anantapur district. This taluk has to its north Penukonda taluk, west the Mysore state and Madakasira taluk, south the Mysore state, and east the Mysore state and Kadiri taluk.

It is an important railway station on the M. & S. M. Railway running from Bangalore to Guntakal. This town is situated mid-way between Bangalore and Anantapur, the district head-quarters. Lying on the borders of the Mysore state, it serves as a gate-way from the British territory into that state.

Tradition says that it was founded by the Mahratta leader Morari Rao and called after his father whose title was Hindu Rao. It is the largest town in the district and the centre of commerce in its southern part.

Its elevation is 2,068 feet above sea-level and it extends one mile from south to north and three-fourths mile from east to west. The town is surrounded by tanks on all the sides except in the west, where, there is the river Penner flowing towards the north. The river is dry for the most part of the year and is not much utilised for irrigation. Dry crops are grown in the surrounding villages with the help of what little rains they get and with the help of tanks and wells.

Relief of the Town and the River.—The town slopes down from south to north and from east to west and it has a big tank as its southern boundary and all the wet cultivation lies under this tank. The river Penner runs above this tank and by the western side of the town; and a temporary dam has been constructed across the river, right above this tank, which is fed by it at flood-time. The river water thus collected in the tank serves as the main source of supply for cultivation, in spite of the failure of rains in the area. The river Penner takes its origin in the Chennakesava hill, to the western side of the Nandi hills in the Mysore state. It is generally in floods during the rainy

season of the south-west monsoon and the tank is certain to get water whenever the river is in floods. A canal has been dug from the dam into the tank, and the dam and the canal have been maintained by the ryots of the place. There are proposals by the Hindupur Municipal Council to dam the river permanently and it may take some years to come into existence.

Rocks and Soils.—Hindupur taluk is for the most part flat when compared with Madakasira which is hilly and rocky towards the south and more level to the west. There is a small hillock near the high school north of it and stones are quarried here for building purposes. Except for this small hillock, the town and its surroundings form one big plain of red soil.

This soil is found suitable for the growth of dry crops. Even a few inches of rain are enough for one crop as the soil is fairly retentive of moisture.

Weather and Temperature.—The district is indeed one of the driest in the Presidency. The hot season begins early in March and ends suddenly with the arrival of the monsoon usually early in June. The southern taluks of Madakasira and Hindupur which slope gradually from the Mysore plateau are considerably cooler than the northern part of the district. Hindupur town proper is 2068 feet above sea level and hence the place has a cool, temperate and agreeable climate throughout the year.

Rainfall.—During May, June, September and October, we have a few inches of rain and these are spread over about 30 rainy days only in the year, the annual (1931) average rainfall being 19.27 inches. From the above account, it is clear that the climate is very dry and quite agreeable to live in. The district as a whole does not get the full force of either monsoon and the rainfall in consequence is often deficient. It is also frequently irregular. The district is in the rain shadow area. The average for the whole district for the 34 years from 1870-1903 was 23 inches and in the southern taluks Hindupur and Madakasira, where the fall is less scanty than elsewhere, over 24 inches is registered.

Public Health.—The climate being dry and agreeable, the public health also is on a par with it. The major portion of the population is healthy and strong and they are fit for hard manual labour. In former years havocs and fears of plague have done much to deter traders from visiting it. It was in the year 1928-9 when the town was vacated for fear of plague, and from

that year the town is free from plague. The death rate is comparatively low, it being 13.64 per thousand while births were 38.91 in 1933.

Crops.—The soil of the district as a whole except in the northern part of it is, generally, very poor and thin. Agricultural practice varies with the amount of rainfall and with the nature of the soil. The soil being poor, and the rainfall low, the crops are mostly of the dry type; and wet crops could be raised only with the help of tank and well water.

Ragi and cholam are the staple food grains of the Hindupur and Madakasira taluks and they are cultivated extensively. These crops are only three months in the field and they require little labour and less water. Red-gram, green-gram and horse-gram are also cultivated in some places though not in such large quantities as ragi and cholam.

Paddy and sugarcane are the chief wet crops cultivated on a small scale. These two crops are raised with the help of well irrigation and they require much labour and expenditure and careful attention. Still, the outcome is not at all encouraging, hence the cultivation of sugarcane is slowly falling off and paddy is cultivated mainly for home consumption. The important money crop of the taluk is groundnut which is grown on an extensive scale. Owing to the depression in its trade and the fall in the price of groundnuts, the ryots of the place have suffered much and they are now in debts considerably, their income having fallen while the expenditure remains the same.

A word may be said here about the rotation of crops and mixed sowing of wet and dry crops in the taluk and in the district. The ryots of the place generally have a dry crop immediately after the wet or vice-versa. The practice of the ryots in the taluk is to sow cholam or ragi immediately after the wet crop. The wells help the above system of rotation to a great extent. The ryots are of opinion that "Whatever the character of the season may be, it will almost suit one or more of the crops in the mixture and that if a quick-growing and a slowly maturing crop are mixed, space is economised, since the former is off the ground before the latter has begun to spread." Ragi which is abundantly grown in the taluk and in the neighbourhood of the town, is generally mixed with samai and black-gram; jonna with groundnut or with gingelly and ragi with yellow-gram. The idea underlying this kind of mixed sowing is to mix the exhausting crops with those that collect nitrogen. It is needless to stress

the importance of these crops for man and beast of the district, especially for the latter which gets ample fodder from these crops. In addition to the above mentioned crops gingelly, chillies, and tobacco are also grown to some extent. A portion of the dry lands are used for cultivating vegetables and all kinds of greens which are supplied to Hindupur town from the neighbouring villages.

Wells and Tanks.—Owing to scanty rain, the whole district is mainly depending on its wells and tanks for its cultivation. Nearly half of the area is irrigated from tanks and wells; and the tanks are rainfed and precarious sources. Both the Penner and its tributary the Chitravati traverse the taluk in the same direction but neither is much utilized for irrigation.

There are two tanks one big and one small, under which the cultivation extends. The small tank is just below the big one at half-a-mile distance and to the east of the town, and it gets its water both from the big tank and from the vast plains extending above the tank area. Again there is a third very big tank below this small tank at nearly one and half miles distance to the north of it and this supplies water for nearly 15 villages and it has thousands of acres of land under its cultivation. The above three tanks seem to lie in a line along a valley where water flows from one tank to another, thus enabling an extensive cultivation to be carried on.

Further there are many wells in the neighbourhood of Hindupur, with the help of which also cultivation is carried on.

Industries.—Agriculture is the chief occupation of India and 50 percent of the population of this place are cultivators. A few important industries also flourish here. Common cloth, gunny bags and blankets are prepared on a large scale and the coarse blankets are sent in thousands for the coolies working in tea and coffee estates of Coorg, Malabar, Mysore state and even Ceylon. This trade in blanket is growing day by day. A community known as Kurubas prepare these blankets and these cumblies are brought to Hindupur market from a distance of more than thirty miles.

There are a few weaver families, who prepare nice cotton and silk saris on a small scale with the help of hand-looms. Further, recently, iron furniture of all types is being prepared locally and the articles are sent to various places in the Presidency. There

FIG 22.

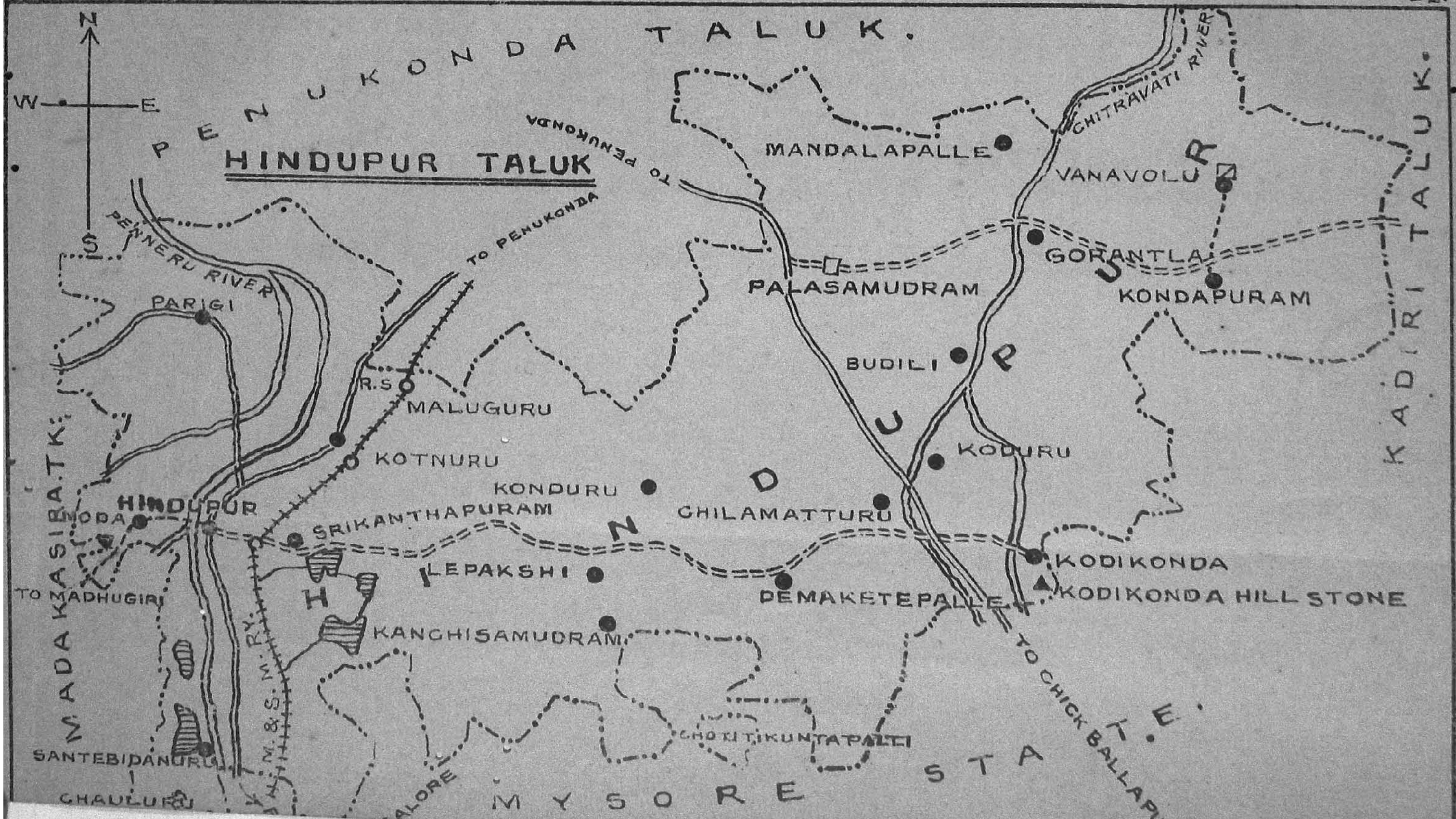
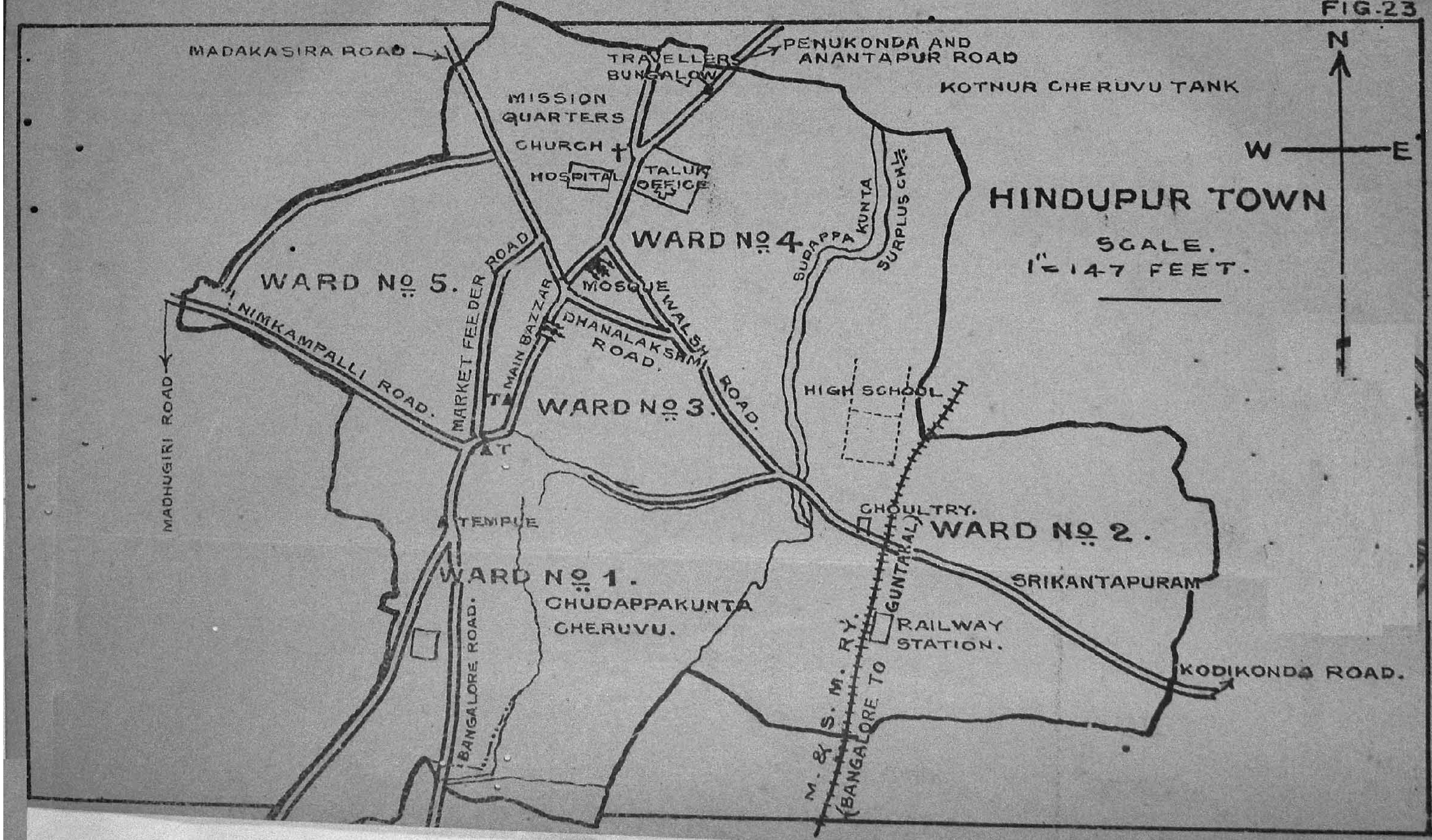
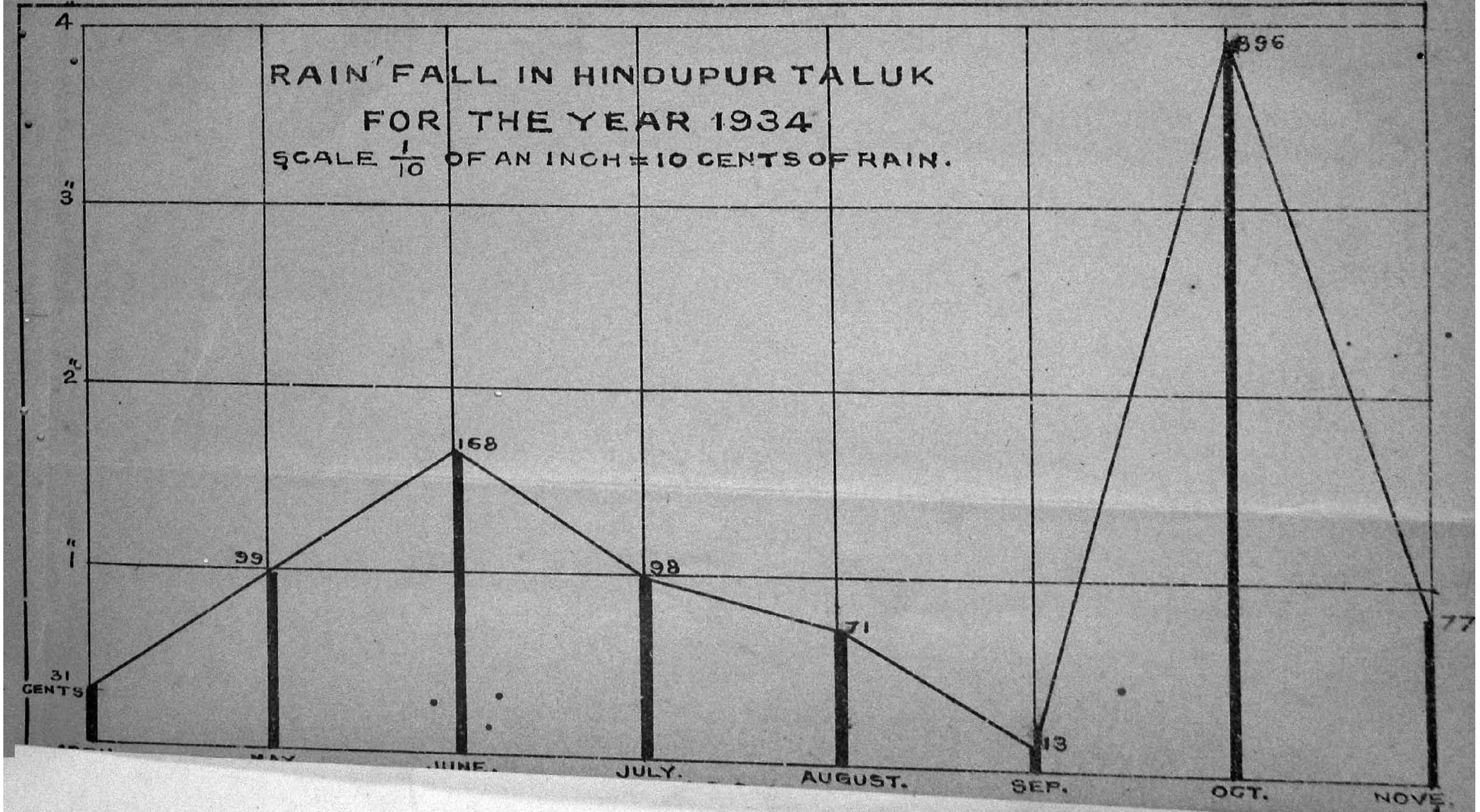

HINDUPUR TALUK
PENUKONDA TALUK.
KADIRI TALUK.
MADAKASIRA T.K.
MYSORE STATE.
HINDUPUR
N
W
E
S
PENNERU RIVER
CHITRAVATI RIVER
TO PENUKONDA
TO PENUKONDA
TO PENUKONDA
TO MADHUGIRI
TO CHICK BALLAPUR.
MANDALAPALLE
VANAVOLU
GORANTLA
KONDAPURAM
PALASAMUDRAM
BUDILI
KODURU
CHILAMATTURU
KONDURU
KODIKONDA
KODIKONDA HILL STONE
DEMAKETEPALLE
LEPAKSHI
KANGHISAMUDRAM
CHOLITIKUNTAPALLI
PARIGI
R.S
MALUGURU
KOTNURU
HINDUPUR
MODA
SRIKANTHAPURAM
SANTEBIDANURU
CHAULURU
M. & S. M. RY.

FIG.23



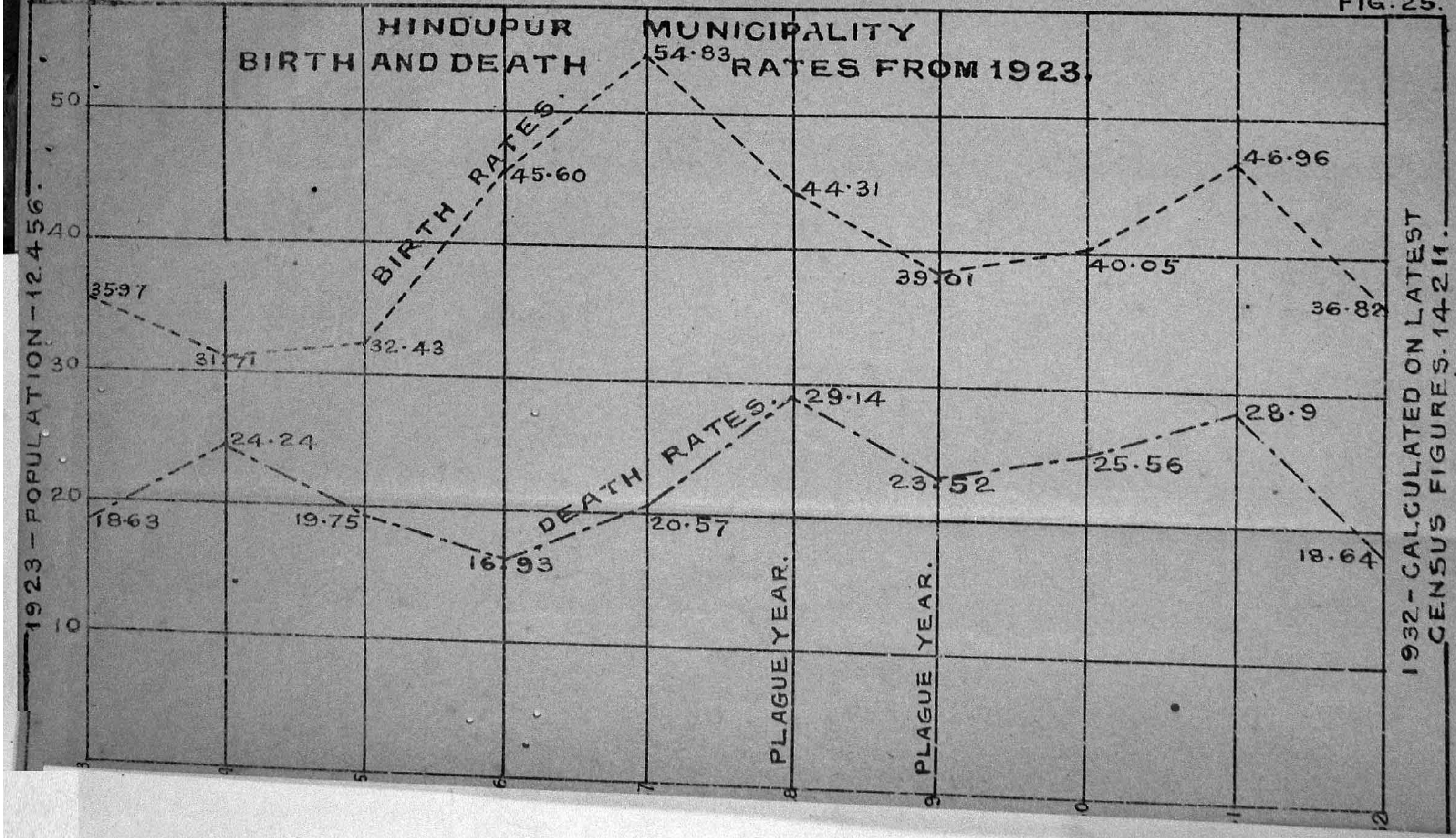
HINDUPUR TOWN
SCALE.
1" = 147 FEET.
N
W
E
MADAKASIRA ROAD
PENUKONDA AND ANANTAPUR ROAD
KOTNUR CHERUVU TANK
TRAVELLERS BUNGALOW
MISSION QUARTERS
CHURCH
HOSPITAL
TALUK OFFICE
WARD No 4
WARD No 5.
WARD No 3.
WARD No 2.
WARD No 1.
MOSQUE
WALSH ROAD.
DHANALAKSHMI ROAD.
MAIN BAZZAR
MARKET FEEDER ROAD
NIMKAMPALLI ROAD.
MADHUGIRI ROAD
SUDAPPA KUNTA
SURPLUS CH.
HIGH SCHOOL
CHOULTRY.
SRIKANTAPURAM
RAILWAY STATION.
KODIKONDA ROAD.
M. & S. M. RY.
(BANGALORE TO GUNTAKAL)
TEMPLE
CHUDAPPAKUNTA CHERUVU.
BANGALORE ROAD.

FIG. 24.



RAIN FALL IN HINDUPUR TALUK
FOR THE YEAR 1934
SCALE 1/10 OF AN INCH = 10 CENTS OF RAIN.
4
3"
2"
1"
31 CENTS
99
168
98
71
13
396
77
JUNE.
JULY.
AUGUST.
SEP.
OCT.
NOVE.

FIG. 25.


HINDUPUR MUNICIPALITY
BIRTH AND DEATH RATES FROM 1923.
BIRTH RATES.
DEATH RATES.
50
40
30
20
10
35.97
31.71
32.43
45.60
54.83
44.31
39.01
40.05
46.96
36.82
18.63
24.24
19.75
16.93
20.57
29.14
23.52
25.56
28.9
18.64
PLAGUE YEAR.
PLAGUE YEAR.
3
4
5
6
7
8
9
0
1
2
1923 - POPULATION - 12.456.
1932 - CALCULATED ON LATEST CENSUS FIGURES. 14.211.

are half-a-dozen groundnut shelling factories and rice mills in the town area. Brick-making is another important local industry.

Besides these, there are some industries connected with agriculture such as jaggery preparation which is carried on, on a small scale. During the season, with the help of crushing mills sugar juice is extracted and boiled and the jaggery is sent to the market. At other times, inferior sort of powdered jaggery is obtained and prepared into good jaggery and sent to other markets where there is a large demand for it; and this industry engages hundreds of persons.

Trade. The most important centre of general commerce in the district is Hindupur and it does a large and increasing trade in jaggery, grain, groundnuts, chillies and tamarind. The internal trade of the district is effected by means of weekly markets which are managed by the local boards and the most important are at Hindupur and Tadiparti. Hindupur is important for its commerce both within the district and outside it on a very large scale.

Shandies are held here on Fridays and Tuesdays to which people flock from a distance of nearly thirty-five miles and above, from all parts of the District. Even the traders from Bangalore, Bellary, Guntakal, Tadpatri, Nandyal and Madhugiri, attend the shandy at Hindupur. Besides a large concourse of people, hundreds of double-bullock carts come to the shandy carrying the commodities. Hindupur market collects grain, jaggery and groundnuts from all the surrounding parts far and near and exports them to other places where they are needed. Branches of foreign firms trade extensively in groundnuts only; while about sixty local mandies, carry on trade in grain, jaggery, chillies, groundnuts, tamarind and other commodities.

Coming to imports, Hindupur gets bales of foreign and Indian piece-goods and sells them to the local and neighbouring merchants.

Communication.—The chief reason for the vast and flourishing trade of Hindupur is its central and commanding position it occupies. It is on the Branch of the Southern Maharatta Railway, (opened in 1893) which runs from Guntakal to Bangalore. The military road that connects Bangalore with Hyderabad runs through this place. There are special passenger trains starting from Hindupur early in the morning both for Bangalore and Anantapur and return trains coming to Hindupur at 9 p.m., leaving Bangalore and Anantapur in the evening. The railway authorities issue daily return tickets for a duration of 48 hours from

Hindupur to Bangalore and Dharmavaram and to any intermediate stations. Besides this train service, there are busses plying from Hindupur to Bangalore and Anantapur both in the early morning and in the noon. Other busses run from Hindupur to Madakasira, Penukonda, Pavagada, Kodikonda, Gorantla, Madhugiri and all other surrounding places.

The town is a node where several roads meet. Metalled roads leading from Madakasira and Kodidonda, gravelled roads leading from Bangalore and Penukonda and cart tracks leading from Madhugiri in the Mysore state meet at this place. It is this net work of communications by train, bus and cart that has greatly helped in the developments of its trade and has enabled Hindupur market to be within the easy reach of the far off peasant and merchant.

Population. On account of its enormous trade and its central position, its population has grown to nearly fifteen thousands and it is one of the largest towns in the district. The town is, however, very backward in education, and there are only 116 literate males and 13 literate females per thousand of the population.

The population mainly consists of labourers, merchants and agriculturists. There are facilities for the expansion of the town and as such there is much scope for the construction of new buildings and as a result there would be work for the labouring classes throughout the year. Further the mandies absorb most of the persons as coolies. Next to the labouring class comes the trading class, and the trade importance of the place need not be repeated as it has already received an elaborate treatment elsewhere. Lastly come the agricultural classes who carry on their cultivation in the same old time-honoured fashion with the wooden plough, bamboo-drill and the bullock hoe. Besides these, there are a few engaged in minor industries such as weaving saries, coarse cloth and gunny sack.

The languages commonly spoken in this area are Telugu, Kanarese, and Hindustani. The town being on the Mysore border, the state has influenced the place in its language and manners.

Next, coming to the communities among the labouring classes, the Boyas predominate largely and these are both the main cultivators and the labourers. This community forms the second largest one in the district. Next, come the Vysyas, i.e. the trading class; and these like the Konkanees of South Kanara, are the greatest trading class. The next important community is that of

the Mohammadans, who trade on cattle, skins, bark etc., besides working in the trading shops as coolies, agents and petty clerks. The other important and rich community are the Lingayats, whose main business is trade; and the entire trade of the place is in the hands of the Vysyas and the Lingayats. Apart from the Hindu and the Muhammadan cummunities, there are some Protestant Christians. Lastly, agriculture, industries and trade of the place have equally contributed to the large growth of the several communities and of the population.

Growth of the town.—Hindupur is a Municipal town with the neighbouring villages, Sreekantapuram and Nimmakammapalli included in its area. This Municipality ranks first in point of finance and administration when compared with the other two municipalities in the district. The town boasts of electric lights.

Formerly, the town grew northwards, towards the taluk office, Police station and the hospital. Now for the last ten years or so, it has a tendency to grow in its eastern direction towards the railway station. Recently the Municipality built its high school on a large tract of waste plain, to the east of the town near the railway station, thus affording scope for the expansion of the town. Several merchants and officers have since purchased house-sites near the Railway Station and are constructing houses. East of the Railway Station, within the Municipal area, a few garden houses have also arisen. It is the nearness to the station, facilities for fresh air and freedom from the din and bustle of the town that induced people to move to the east of the town. It is the high school and the railway station as well as the higher level that have thus contributed to the expansion of the town in the easterly direction. Consequently, site value of the land has gone up in that area.

The Municipal Council has also done a little to help in the expansion of the town in the easterly direction. There are about 50 acres of land just below the small tank which lies between the station and the town, and formerly this area formed wet lands, being cultivated with the help of the tank water. But as it now falls in the centre of the growing town, the Municipality has declared this particular area an Industrial area where no buildings for actual habitation should be built and only factories and other industrial buildings should be erected. Therefore people are compelled to construct houses to the east and west of the Railway Station. Thus all the above circumstances helped in the growth of the town to the east towards the railway station.

A Note on the Communication-Lines of Anantapur District

BY

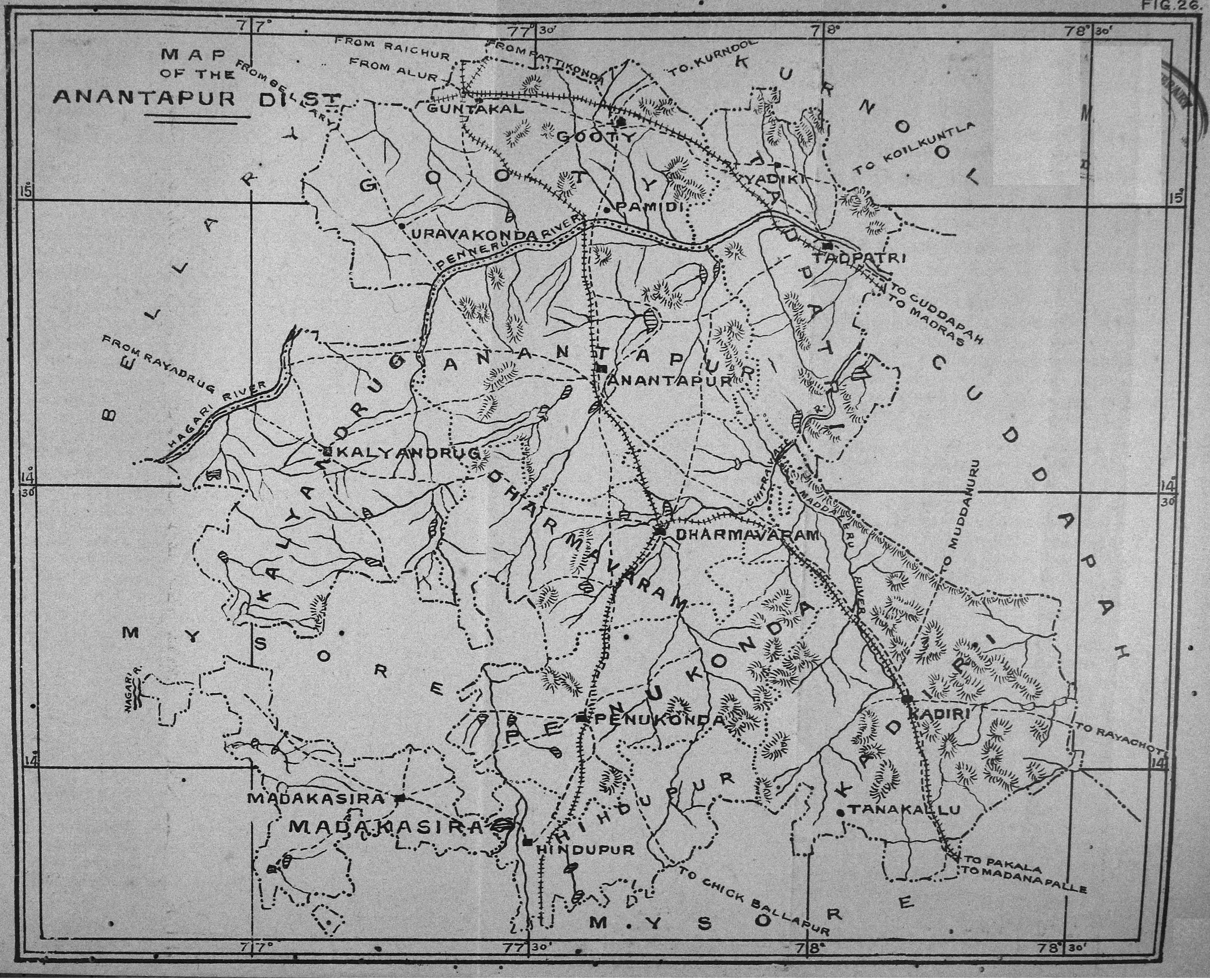
MR. N. SUBRAHMANYAM, M.A., L.T., F.R.G.S.,

In this short note it is necessary to consider at the outset the influence of location and relief on the routes passing through the district of Anantapur. Being situated between the important parts of the Deccan and Southern India, this central area of the Ceded Districts and the heart of Rayalseema, has never in the past been a bone of contention between opposing hosts for any intrinsic value of its own, but has always been a thoroughfare of invading armies from north to south or the other way.

An examination of the relief of the region on a large-scale physical map reveals the fact that the main trend of the feature lines such as the mountains and the valleys is longitudinal in the greater part of the district except in the north, thereby facilitating such a north-to-south movement. Barring the coastal route in the east and the more westerly routes along the Tungabhadra and the Huggri valleys, four distinct north-to-south routes can be traced passing through the district from the south and the south-east and converging and crossing towards the north of it at the nodal centres of Gooty and Guntakal.

Two of these routes are taken by the two roads from Bangalore that run northwards along the parallel valleys of the Penner and its tributary the Chitravathi, which unite a few miles south of Penukonda and continue partly along the latter valley to Anantapur and Gooty. The railway from Bangalore to Anantapur keeps at first to the Penner route, but subsequently crosses over the Penukonda divide along with the road into the Chitravathi valley. It then makes a bend to reach Dharmavaram, while the main road-way keeps a more straight course to Anantapur. Further north at Pamidi after crossing the Penner, the road and the rail part company, the former continuing its northerly course to Gooty while the latter runs in a north-westerly direction to Guntakal Junction. From Gooty the road is carried to Kurnool and thence to Hyderabad (Secunderabad). This is the main north-to-south route that crosses the district, link-

FIG. 26.


MAP OF THE ANANTAPUR DIST.
77°
77° 30'
78°
78° 30'
15°
14° 30
14°
FROM RAICHUR
FROM PATTIKONDA
FROM ALUR
FROM BELLARY
TO KURNOOL
TO KOILKUNTLA
TO CUDDAPAH
TO MADRAS
TO MUDDANURU
TO RAYACHOTI
TO PAKALA
TO MADANAPALLE
TO CHICK BALLAPUR
FROM RAYADRUG
KURNOOL
CUDDAPAH
BELLARY
MYSORE
M.Y.S.O.R.E
GOOTY
TADPATRI
ANANTAPUR
KALYANDRUG
DHARMAVARAM
PENUKONDA
KADIRI
HINDUPUR
MADAKASIRA
GUNTAKAL
PAMIDI
YADIKI
URAVAKONDA
TANAKALLU
PENNERU RIVER
HAGARI RIVER
CHITRAVATI
MADDILERU RIVER
NAGARI R.

ing up the states of Mysore and Hyderabad as well as the rest of the Deccan.

Let us take next the other two communication-lines from the south (really the south-east) one by one and not together, as they start from distant parts and do not unite till they reach Gooty and Guntakal in the north of the district, as already stated. Both these are historic routes from the south-east to the north-west and vice versa, used by the Pallavas and the Cholas from the south as well as by the Chalukyas, Rashtrakutas, Mahrattas and the Mahomedans from the north.

The first of these two routes from the south-east is that taken by the road and the railway from Chittoor and Pakala through Damalacheruvu pass, Madanapalle and Kadiri to Anantapur. Notice that here too the railway deviates a little to reach Dharmavaram as in the case of the Guntakal-Bangalore line, while the road runs more directly to Anantapur, showing that probably the importance of Dharmavaram is of more recent origin. From Anantapur the road continues its north-westerly course through Uravakonda to Bellary and Hospet, and thence beyond the Thungabhadra to Bombay. The headquarters of the district thus happens to be an important nodal centre where the Bangalore-Secunderabad trunk road crosses the Madras-Bombay trunk road.

The other route from the south-east is that taken by the Madras—Raichur broad-gauge line of the M. & S. M. Railway, which is continued from the latter place to Bombay. But the roadway does not follow this route right along at the present day owing to the gap in it in the Kodur-Mamandur forested region, which is less frequented now-a-days than the Damalacheruvu-Kadiri route, though historically this route also seems to have been as much used by invading armies as the other. From Cuddappah, however, the road runs along this route, parallel to the railway-line through Tadpatri to Gooty and thence to Guntakal. The latter place is an important nodal centre of railways where not only the Bangalore-Secunderabad (south-to-north) line crosses the Madras-Bombay (south-east to north-west) line, but also the east-to-west metre-gauge line from Masulipatam to Marmagoa crosses the district in its north-western fringe.

The outlying westerly taluks of Madakasira and Kalyanadurg, which are quite away from the railway-line are linked by roads with the rest of the district—the former from Hindupur and Penukonda and the latter from Dharmavaram and Anantapur.

There is regular bus-service not only along most of these roads within the district but also to the adjoining districts of Bellary, Kurnool, Cuddappah and Chittoor. But bus traffic does not seem to be so well developed in this district as in several other districts; and this is no doubt largely due to its comparative poverty and backwardness as well as to the paucity of its population. The bus traffic from Gooty and Tadpatri to Anantapur is, however, larger, as passengers by the broad-gauge line often prefer to save time, by avoiding the circuitous journey via Guntakal.

To sum up, the communication-lines through the district are mainly longitudinal and they converge towards the north at Gooty and Guntakal, whereas they diverge southwards to Bangalore, Chittoor and Madras.

Before closing this short paper, a few observations may be made regarding the condition of the roads in the district. The trunk roads are comparatively recent, dating from 1866 and 1876 when they were constructed as famine relief works. Though the ground is generally hard and good road metal is ordinarily available in most parts, the condition of the roads is not quite satisfactory; and this is due partly to the want of funds and partly to the want of a sufficient supply of water, which is required for consolidating the metal when the road is laid or repaired. The absence of avenue trees and of road-bridges in most parts are other drawbacks, which are traceable to the same two causes mentioned above. It is interesting to note how exactly opposite physical circumstances are responsible for the unsatisfactory condition of the roads in two distant and dissimilar regions like Malabar and Anantapur. The heavy rainfall of the former district results in the badly cut-up roads after the monsoon, while the paucity of rainfall and the insufficiency of water supply accounts for the improperly consolidated roads of Anantapur. The same poor rainfall explains why the general absence of road-bridges does not cause as much inconvenience or dislocation of traffic as it might otherwise cause or as it might cause elsewhere. It is also interesting to note the relatively high proportion of through railway traffic as against the small local traffic; and this is accounted for by the location of the district where two or three important highways of the Peninsula cross it, though the district itself is too poor, backward and thinly populated to be able to support a larger traffic.

News & Notes

With this number the Journal completes the ninth volume. Not only has its size been more than doubled from what it was in the first few years, improvements such as lino-type printing, a larger number of illustrations, finer get-up have been introduced; and of late a special section for teachers, entitled *Geography and Education*, has been included. Members who have not been subscribing for the Journal are requested to do so from the new year (i.e. from 1st April 1935), and thereby support this useful endeavour, so that further improvements can be effected in the coming years. At the request of several members, provision has been made to receive the subscription in instalments of unbroken rupees at the option of the member.

* * * * *

The present number contains the *Presidential Address* of the *Fifth Geographical Conference* held at Anantapur during the last Christmas week as well as most of the papers read therein—all studies of Anantapur district from various points of view. For want of space a few of these papers have been kept over for publication in the next issue. The Conference was a successful one, being well-attended by teachers from several parts of the Presidency. Some important resolutions were also passed at the Conference which are published under an account of its Proceedings elsewhere.

* * * * *

In his *Presidential Address* Dr. James H. Cousins made a comprehensive survey of the position of Geography in the educational systems of South India, and made valuable suggestions for improving the position of the subject at all stages of its teaching, besides presenting a lucid and inspiring aspect of it from the higher cultural point of view.

* * * * *

Diagnosing the causes for the neglect and low position of Geography in the schools of South India, Dr. Cousins traces one of them to the way that students are selected for training in Teachers' Colleges. He says:—"The graduate teacher of other subjects enters the Training College with a guaranteed previous knowledge of his subject. But in Geography alone there is in the

Training College the paradoxical spectacle of prospective teachers being taught the pedagogy of a subject without a previous knowledge of the actual subject—a striking but lamentable example of putting the cart before the horse, and also of giving patronage to the mere bookishness of much of Indian education that good educators deplore. Such a practice would not be tolerated in any other subject of a scientific kind, puts premium on shallowness, and explains though it does not justify the wide-spread but false notion that anyone is fit to teach Geography. * * * Obviously the Training Colleges should take advantage of the Diploma course in the University as an essential preliminary qualification of a teacher undergoing training in Geography, and should take in such diploma-holders irrespective of previous service, guaranteed appointment, or other restrictions, which may or may not be necessary in normal circumstances but should be temporarily waived in the case of a new subject. If sufficient diploma-holders are not available for training in the subject, then others might be chosen under the conditions that they should have handled the subject for a certain minimum time."

* * * * *

One of the Resolutions at the Anantapur Geographical Conference is an appeal to Headmasters to arrange to provide for the teaching of C-Group Geography in their schools, not only for the sake of pupils who have a natural aptitude and taste for the subject but also for the sake of those pupils who primarily take up science as their first choice but would prefer Geography to History as their second subject. In this connection, we have to refute a fear, unfounded as all such fears are, that the provision of C-Group Geography would involve a very costly equipment. Feeling that this wrong idea would scare away some Headmasters, the Standing Committee of the Association has been asked to prepare a list of minimum equipment, required for teaching C-Group Geography. This list, which has just been prepared, has been included in this number under the Section "*Geography and Education.*" Copies of it will be despatched shortly to all Headmasters of High Schools for their information and guidance.

* * * * *

Another Resolution of the Conference makes a similar appeal to Principals of Colleges to provide for the teaching of Geography in the Intermediate Course; and the Standing Committee has prepared a similar list suitable for that course and it is also pub-

lished in this issue. Copies of it will be sent to Principals of Colleges for their information and guidance.

* * * * *

Thanks to the timely concessions of the railway companies, there was no special need for arranging any excusions as part of the programme of the Conference as in previous years, since almost every teacher that attended the Conference with the Christmas special season ticket visited most of the important places worth visiting in and around the district of Anantapur. It is, however, to be regretted that as these visits were mostly individual and not properly organised so as to derive the best educational values, they were more often treated as mere opportunities for sight-seeing and pilgrimage.

* * * * *

As part of the activities of the Conference at Anantapur, a Refresher Course for elementary school teachers was organised and conducted at Anantapur. Its varied programme included a course of lectures on Geography by Mr. A. K. Balasundaram, District Board Educational Officer of Anantapur. The teachers, over 200 in number, who attended the course were benefitted by his inspiring and useful talks, which were highly practical.

* * * * *

Another adjunct of the Conferences was the Educational Exhibition, in which Geography was fairly well-represented. Among the note-worthy exhibits were some relief maps and picture maps as well as interesting album collections. We wish, however, that more of cheap and home-made apparatus and appliances form the main feature of the Geography section of educational exhibitions than mere copying work, however neat and artistic they may be.

* * * * *

The next Geographical Conference will most probably meet in Salem in May 1936. Meantime, the Association which will run through its tenth year of life during 1935-36, will have its decennial celebration taking place in Madras sometime in Michaelmas or Christmas of this year. Details about it will be decided in the Working Council and notified to the members.

* * * * *

In response to requests and inquiries from several quarters, it has been decided to organise another Summer School of Geography in Madras or Saidapet during May 1935. Details regarding the course will be published in due course.

* * * * *

It is pleasing to note that teachers of Geography who have been handling the subject in Form IV this year have come to appreciate and like the new B-Group syllabus, after studying the hints and comments regarding it in an earlier number of the Journal and carrying on their teaching accordingly. A few, however, while accepting it as a carefully prepared, useful and purposeful syllabus, still feel that it is somewhat heavy. The remedy is in their own hands, to drop some details in such topics that they consider could conveniently be pruned. The running of practical work and general *principles of Geography through a course of* Indian Geography and the outline study of a few typical regions of the World to give the world outlook is the only convenient and workable compromise, if the Regional Study of World Geography by all pupils in the V and VI forms is made impossible by the present scheme.

* * * * *

It has been generally felt that the lower school (including the middle school) has not yet been touched by the leaven of new ideas and methods regarding the teaching of Geography; and the reason for this state of affairs is to some extent attributed to the neglect of the subject in the training schools. Without accepting the truth of this statement as unproven, it is worth while to probe the matter in a constructive way, and find out how far it is possible for training schools to contribute to the improvement of Geography teaching in the lower and middle schools. We are therefore, getting an experienced Headmaster of a Secondary Training School who is himself technically qualified in the subject to discuss the topic from his inner knowledge of the conditions and circumstances obtaining in such institutions.

* * * * *

We are sorry to have omitted to acknowledge in our last issue that the block of the map of railways in South India published in it was kindly lent by the Editor of the South Indian Teacher. Owing to hurry and oversight, the receipt of that Journal has not been acknowledged.

* * * * *

We close this number with an appeal to all members that each of them should try to secure at least one more member, so that the strength of the Association may be doubled by the time we have our First Decennial Celebration.

The Madras Geographical Association

PROCEEDINGS OF THE V GEOGRAPHICAL CONFERENCE ANANTAPUR SESSION : DECEMBER 1934.

The Fifth Geographical Conference of the Association commenced its sittings on the afternoon of Monday the 24th December 1934 at the Ceded Districts College Hall, Anantapur under the Presidency of Dr. James H. Cousins, M.A., D. Litt, Principal, Theosophical College, Madanapalle.

Besides the following members of the Association, there was a large gathering of visitors:—Mr. A. K. Balasundaram (Anantapur), Mr. C. Ranganatha Iyengar (Gooty), Mr. Lakshmipathi (Uravakonda), Mr. G. Sesha Sarma (Anantapur), Mr. M. V. Srinivasan (Penukonda), Mr. M. Venkatasubbiah (Anantapur), Mr. K. N. Pasupathi Iyer (Kurnool), Mr. N. Raghavachari (Anantapur), Mr. N. Ramasubbier (Anantapur), Mr. T. Abdur Rahman (Kadiri), Mr. N. Subrahmanyam (Madras), Mr. Abdul Khader (Vellore), Mr. M. S. Sabhesan (Madras), Mr. S. T. Ramanuja Iyengar (Trichinopoly), Mr. K. S. Chandrasekharan (Madras), Mr. V. Koprasa Char (Gooty), Mr. R. Srinivasan (Madras), Mr. T. S. Suryanarayana (Madras), Mr. R. Seshagiri Rao (Ellore), Mr. G. Mahadeva Iyer (Madras), Mr. A. R. Srinivasa Iyer (Madras), and Mr. P. Sridhara Rao (Madras).

After the Welcome Address was delivered by Prof. A. V. Venkatarama Ayyar of the Ceded Districts College, Dr. J. H. Cousins was installed in the Presidential Chair and delivered the Presidential Address (published elsewhere). The opening session closed after the announcement of the detailed programme for the next two days.

At 8 a.m., on Tuesday the 25th December, the second session was held, when about half a dozen papers on various aspects of the Geography of Anantapur District were read and discussed.

At the concluding session which was held at 8 a.m., on Wednesday the 26th December three more papers were read and the remaining ones were taken as read for want of time. The following five resolutions were also passed unanimously:—

(1) This Conference, while deprecating frequent changes in the determination of the knowledge content of the S. S. L. C.

Scheme, requests the Director of Public Instruction to give Geography its proper place in the next revision of the S. S. L. C. Scheme.

(2) This Conference urges on the Principals of Colleges in the Presidency to provide for the teaching of Geography as an option under part III, Group 1 of the Intermediate Course.

(3) This Conference urges on Headmasters of schools to make provision from the next school year for the teaching of Geography as a C-Group subject of study under the 1934 S. S. L. C. Scheme.

(4) This Conference requests the Standing Committee of the Madras Geographical Association to draw up at an early date and issue for the guidance of heads of schools and colleges a list of minimum requirements by way of equipment for the teaching of Geography in the High Schools and Colleges of the Presidency.

(5) This Conference conveys its thanks to the Surveyor-General to the Government of India for the concession granted by him of half-rates to educational institutions for single copies of topographical maps of the Government of India, and requests him to extend the concession in the interest of map-study in schools to the purchase of at least a dozen maps of each kind.

After the concluding speech of the President, vote of thanks was proposed to the President, to the authors of the several papers and to the visitors who responded to the invitation. The Conference then came to a close.

Reviews

An Introduction to Mapwork and Practical Geography. By John Bygott. (University Tutorial Press, Ltd., London). Price 8sh. 6d.

This is a text-book on modern lines, providing an introductory course in map-reading and practical geography, suitable for use in the upper forms of schools (for C-group Geography) and for the Intermediate Course in Geography.

Part I, which deals in 13 chapters with Mapwork, takes the student through preliminaries of Map-reading to the study of Ordnance maps, distributional maps and the graphical representation of geographical statistics, and the study of weather and climate maps, including a clear exposition of map-projections in three chapters. A notable feature in this part is the inclusion of portions of actual Ordnance Survey maps. The weather map is also dealt with in great detail with a reproduction and discussion of many typical examples.

The problem of map-making is approached in a simple and clear manner, so that the students can easily see how survey work supplies the data for the map, and why particular projections are selected for particular purposes. Simple graphical methods for constructing important projections are carefully explained.

Part II deals with Surveying in four chapters including contouring, while the last chapter in it treats of the interpretation of Geological Maps.

The volume is illustrated with a number of important and necessary diagrams ; and many useful and suggestive questions and exercises have been appended at the end.

The book is comprehensive, bringing within its compass material that is usually treated in two or three different volumes. In fact, it fills a gap, and can be recommended for use as an introductory book by the University Diploma Students, as a text-book by the Intermediate students and as a reference book in the High School.

Practical Map Books : Book 4—North and South America. By S. J. B. Whybrow (J. M. Dent & Sons, London). Price 10d.

This is the fourth book of the series of which the first three were already reviewed in earlier numbers of the Journal. Like the others, this book also is intended to supplement the text-book and the atlas rather than to take their place. The working out of

the given exercises on the blank maps is calculated to ensure a knowledge of topographical accuracy, besides helping the study of familiar material from fresh points of view. Starting with the study of the position and physical features of the two continents, the exercises take the student through climate, products and natural regions, and then finish up with a study of density of population and trade. The use of this series of books will prevent parroting in the study of Geography, since the facts will be fixed in the mind as the exercises are being worked out.

Geography of Madras Presidency (in Tamil). By Mr. C. Venkatesan (Educational Publishing Co., Madras). Price 6 annas.

This is an altogether original book on refreshingly new lines away from the beaten track of over-logical and over-systematised Geography that is usually pumped into the little ones in this part of the world. A chatty little book, the device has here been adopted of bringing together merchants from the different parts of South India, who discuss at the host's residence in Madras the varying products, life and conditions in their respective homes which happen to be distinct regions. The language is simple; and the dialogue method which has been followed is well calculated to rouse the curiosity and interest of the children. It is specially pleasing to note the emphasis on food, dress and other aspects of social life of the people in the different regions.

The title of the book may well have been "*Geography of South India*" rather than of *Madras Presidency* inasmuch as the Indian States of Mysore, Travancore etc., have also been included for a fairly full treatment. The book is, however, easily capable of desirable improvements such as a more equal and even treatment of the different sub-regions, the avoidance of a few inaccuracies, the adoption of wider regional instead of narrow district heads of classification, and a better set of pictures, some of which merely smudge the paper and one of which at least, the Madras Harbour, is quite wrong.

We congratulate the author on having had the courage and the imagination to strike an impressive new line of treatment and produced a book which is really interesting to children.

Indian Culture (Journal of the Indian Research Institute, Calcutta). Published by Satis Chandra Seal. Volume I, Parts 1, 2 and 3. Inland subscription Rs. 6: foreign subscription 10sh.

We have great pleasure in welcoming this Quarterly Journal of the Indian Research Institute of Calcutta. The first three num-

bers before us show that this Journal attempts to bring within the purview of its studies and researches all topics relating to Indian culture in the most comprehensive sense of the term, including history, geography, art, architecture, iconography, epigraphy, numismatics, religion, literature, philosophy, ethnology, anthropology, folklore etc. It is gratifying to note that the papers are all of a high order, being treated in a scholarly way by persons who are masters in their respective spheres of study and fields of research.

In our Journal attention has naturally to be drawn to the "Geography of Kautilya" by H. V. Trivedi, in which an attempt has been made at reconstructing some bits of Ancient Indian Geography by a discussion bearing on the identification of geographical places and products (pearls, gems and spices), mentioned in the 11th chapter of the 2nd book of Kautilya's Arthasastra. Several of the other articles, which are chiefly historical, throw side-lights highly helpful in the reconstruction of Ancient Indian Geography.

Report of the Department of Industries, Madras for the year ending 31st March 1934. (Superintendent, Government Press, Madras). Price 1 Re. 2 as.

This Report of the Madras Industries Department gives a fairly full account of its varied activities during the period under report. It is interesting to find that in spite of the continued and general economic depression the number of new industrial undertakings registered during the year was the highest recorded. Of these, three were cotton mills, five ginning factories, four sugar factories, one steel rolling mill and three mining companies. The supply of electric energy from Pykara accounts for the flotation of the three cotton mills and five ginning factories with their head offices at Coimbatore. The industrial possibilities of the area adjacent to Mettur are under consideration. There was an increase in the output of manganese and barytes while that of magnesite and mica showed a reduction. Exports of manganese and mica rose, the value of exports of the former to the United Kingdom being more than double that of the previous year.

As a result of the preferences granted by the Ottawa Trade Agreement, trade with the United Kingdom improved during the year, the total export to that country from this Presidency having increased by Rs. 100 lakhs. The products that chiefly contributed to the increase in the export trade were cow-hides, raw cotton, sheep-skins, tobacco, coir (manufactured), castor-seed, ground-

nuts and rubber. In order to take full advantage of the high tariff on sugar imports, the department assists the development of the sugar industry in several ways. Altogether the Report is interesting as showing the various ways by which official help is being rendered for the growing industries of the province.

Wall Map of Villupuram Taluk and Wall Map of Kallakurichi Taluk (in Tamil): By K. Narayanaswami Ayyar, Municipal High School, Villupuram.

These two wall maps have been prepared by an experienced teacher of Geography, who is already the author of some local geography books on practical lines. Excepting the Taluk Maps prepared by the Madras Survey Department, which are in English, there are at present no maps for the two taluks, as for most other taluks, prepared in the mother-tongue and suitable for elementary schools. They, therefore, fill a gap and satisfy a felt need. The taluk areas are divided into firkas, shown in different colours; and only important place-names have been included, written in bold type. The chief hills, tanks and rivers have been marked as well as communication-lines; and of the latter not only roads and railways but also metalled roads and country tracks have been differentiated. The map of Kallakurichi Taluk, which is apparently a later production, shows improvements on that of Villupuram, showing more features, physical and human, of which the representation of forest areas needs special mention. The lithographers are to be congratulated on the bold and neat lettering and proper binding, mounted on cloth with rollers. It is hoped that the Board authorities in the district of South Arcot will arrange to supply these maps to their elementary schools in the two taluks, and that private managers also will encourage the use of them in their schools.

Relief Model of the Southern Continents: By M. S. Paul, Board Middle School, Udayarpalayam.

Mr. Paul, who has exhibited similar models in various educational exhibitions and obtained credit in the shape of certificates and medals, has sent us this relief model which looks quite neat and well-prepared except for a few little inaccuracies of relief, which it is hoped will be avoided in future models. He is prepared to supply any relief models required at very cheap prices.

Books and Journals Received

Practical Map-books: Book 4—*North and South America*: By S. J. B. Whybrow.

Geography of the Madras Presidency (Tamil): By C. Venkatesan.

Relief Model Map of the Southern Continents: By M. S. Paul.

Wall Map of Villupuram Taluk: By K. Narayanaswami Ayyar.

Wall Map of Kallakurichi Taluk: By K. Narayanaswami Ayyar.

South Indian Teacher: August to December, 1934.

Kalaimagal: November and December 1934, and January 1935.

The Educational Review: November and December 1934, and January 1935.

The Geographical Journal: November and December 1934.

Educational India: November and December 1934.

The Scottish Geographical Magazine: November 1934.

Indian Culture: July and October 1934, and January 1935.

Travaux de l'Institut Geomorphologique: Books VI to XI, 1933 and 1934.

Bibliografia Vostoka: Books I to VI, 1932 to 1934.

The Indian Educator: December 1934.

Our Home Magazine: December 1934.

Report of the Madras Department of Industries for the year ending 31st March 1934.

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LIST OF MINIMUM EQUIPMENT FOR 'C' GROUP GEOGRAPHY FOR THE S. S. L. C. COURSE

(Prepared by the Standing Committee of the Madras Geographical Association.)

Name of the Book.	Name of the Author.	Publishers.	Rs.	As.	Ps.	£.	sh.	d.
REFERENCE BOOKS.								
A Groundwork of Modern Geography	A. Wilmore.	Bell and Sons. (Indian Agents: Longmans.)				0	7	6
Physical Geography	Lake.	Cambridge University Press. (Indian Agents: Macmillan.)				0	7	0
Human Geography for Secondary Schools, Books II and III.	Fairgrieve and Young.	George Philip and Son. (Indian Agents: Longmans.)				0	6	6
Descriptive Geography from Original Sources (6 Books: one book for each Continent)	Herbertson (A. J. & F. D.)	A. and C. Black. (Indian Agents: Macmillan.)				0	15	0
ANY TWO OF THE FOLLOWING TEXT BOOKS:								
A Geography of the World (Two parts)	N. Subrahmanyam.	Indian Publishing House.	3	0	0			
The World (Indian Edition)	L. Dudley Stamp.	Longmans Green and Co.				0	5	0
Our World: A Human Geography	Cameron Morrison.	Macmillan and Co.				0	4	0
New Regional Geographies, Book IV. (The World)	Leonard Brooks.	University of London Press, (Indian Agents: Longmans.)				0	7	6
METHOD BOOKS.								
A Handbook for Geography Teachers	D. M. Forsaith.	Methuen and Co.				0	4	0
Geography in School.	James Fairgrieve.	University of London Press, (Indian Agents: Longmans.)				0	7	6
Principles and Practice of Geography Teaching	Barnard.	University Tutorial Press, (Indian Agents: Oxford University Press)				0	4	6
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A Classbook of Practical Geography.	Fairgrieve and Young.	Philiph & Son, (Indian Agents: Longmans Green & Co.)				0	2	6
Exercises in Ordnance Survey Maps.	C. H. Cox.	Bell and Sons, (Indian Agents: Longmans)				0	2	0
Outdoor Geography.	Hatch.	Blackie & Son.				0	2	3
Educative Geography	Haddon.	G. W. Bacon & Co., (Indian Agents: Blackie & Son.)				0	1	6
ATLASES.								
Oxford Advanced Atlas.	Bartholomew.	Oxford University Press.				0	10	6
Atlas of Economic Geography.	Bartholomew, Lyde and Shackleton.	Oxford University Press.				0	8	6
MAPS.								
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1" Map of the Survey of India—12 copies of the Map of the Home Region		The Map Records and Issue Office, 13, Wood Street, Calcutta.	18	0	0			
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LIST OF MINIMUM EQUIPMENT IN GEOGRAPHY FOR THE INTERMEDIATE COURSE.

(Prepared by the Standing Committee of the Madras Geographical Association.)

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